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WAR NEUROSIS

A YEAR IN A NEUROPATHIC HOSPITAL

BY

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Diagnosis

Those of us who treated the psychoneuroses during the last war have been struck by the difference in the picture presented of the neuroses in hospitals in this war. The increase in the "psychosomatic" disorders was to be expected, for although it has for long been agreed that dyspepsia, cardiac, and other somatic conditions often had their origin in anxiety and other emotional causes, the extent of this was not generally realized, and only in recent years have they been recognized to constitute a distinct clinical entity. That there are more cases of mental backwardness is no doubt because the hospitals are now fed from the home base instead of obtaining their patients from abroad, as in the last war. The increase in the number of cases of "psychopathic personality" may be due to both these causes, to a clearer recognition of this group of disorders, and to the fact that we get so many patients who should never have passed the recruiting board. But the most striking change is the far greater proportion of anxiety states in this war, as against conversion hysteria (blindness, paralysis, etc.) in the last war. This is made clear in a table of diagnosis given below. Taking the psychoneuroses alone (577 cases), 64% were anxiety states and only 29% hysteria. The reason for this distinction is not yet clear, but there are probably several causes. In the first place there were far *more traumatic cases* in the last war; and traumatic experiences, owing to their physical accompaniments, are more likely to produce somatic symptoms of the hysterical type than are ordinary conditions of danger. Dunkirk, Norway, and air raids in this country have provided some, but they are negligible compared with the thousands of "shell-shocked" patients who returned from the Somme and other great battles of the last war.

But the larger proportion of anxiety cases compared with conversion hysteria may be due to another reason—namely, that in this war the soldier is much *nearer the home front*. This means, in the first place, that many chronic neurotics who should never have been recruited, and who in the last war would never have found their way to France, break down and are admitted to the neuropathic hospital, sometimes within two or three weeks of recruiting.

There were a few such cases in the hospitals in the last war, one instance of which comes to mind—that of a man who at 11 o'clock every morning developed a severe headache, which started when at that hour one morning it was announced that his regiment was to be drafted to France. But such "civilian" patients were the exception rather than the rule, and the neurasthenic hospitals of the last war were usually filled with *true* war neuroses. In the 41st General (Neuropathic) Hospital the majority of patients have little to do with active service, and conform to the civilian type, and therefore to the civilian type of neurosis, which tends much more towards the anxiety than to the conversion group of neuroses.

Thirdly, the preponderance of anxiety states over hysterical may be partly due to the opposite fact—namely, that the air raids have brought us *nearer to the front line*; and the evidence goes to prove that the nearer the front line the greater the proportion of anxiety states compared with conversion hysteria.

If we had the figures from the casualty clearing stations in the last war we should probably find that the picture corresponded more closely with that at home in this war; indeed, Dr. Dillon's figures* from France showed that 70% were states of anxiety and only 20% conversion hysteria. But many of these conditions near the battle zone are cases of *ordinary* anxiety and panic—natural states due to an objective danger, in which there is no amnesia, no repression (in the technical sense), and no dissociation, and which must therefore be distinguished from anxiety *neurosis* such as we meet with in hospital, in which one or other of these mechanisms is usually found. One meets with various types of anxiety after a bombardment or a "blitz," some of which are true neuroses, but many of which are simple states of fear or anxiety that pass away with the passing of the stimulus of danger. The fact that these patients are predisposed to anxiety, as we shall see most of them are, does not mean they are neurotic: they are simply frightened. Rest for a few days with sedatives and a little elementary psychotherapy is often enough to restore such a man's courage and confidence so that he returns to duty. The excellent results reported as having been obtained with prompt treatment near the front line during the last war may have been partly due to the fact that such cases of ordinary anxiety, which are not cases of true neurosis, are included. But in other instances we may see, as time passes, the process of repression and symptom formation taking place with the transition from ordinary anxiety into neurotic symptoms, hysterical and psychosomatic. The so-called "period of meditation" between the original trauma and the onset of definite neurosis was in fact the period of transformation of this emotional conflict into the somatic or other neurotic

**The Neuroses in War*, edited by E. Miller, p. 120.

symptoms. Such cases also may often be satisfactorily dealt with on the spot; indeed, our aim should be to catch these conditions before their transformation from anxiety to hysteric symptoms is effected. Many of these early cases of neurosis can, with prompt treatment, even be sent back to the line; but for how long it has never been determined, since there is no evidence of their later history. Many of them undoubtedly relapsed.

But in spite of the stress which has been laid on the importance of early treatment of the neuroses, and the excellent arrangements which have been made for such patients to be examined and treated as early as possible, we have found in an unselected number of cases—50 in all—that the average period between the time when the man first "went sick" with the neurosis *in this country* and when he reached the neuropathic hospital was 7½ months! By that time many of our patients are so bored with hospitals and medical examinations that co-operation is difficult to obtain and treatment is unnecessarily prolonged.

The table of diagnosis (which had to follow the very inadequate *Nomenclature of Diseases* of the Royal College of Physicians used in the Army) shows that of a total (for ten months) of 700 patients, 53% belonged to the anxiety group, whereas only 24% were diagnosed hysteria.

TABLE I.—*Diagnosis of 700 Cases*

(*a*) Psychoneuroses (577):		(*b*) Psychopathic personality	63 (9%)
Psychoneurosis (alone)	15	Psychopathic personality	29
Obsessions	8	Temp. instability	34
Neurasthenia	13	(*c*) M.D.	7
Hysteria	170 (24%)	(*d*) Psychotic	24
Anxiety neurosis	371 (53%)	(*e*) Epilepsy	5
		(*f*) Physical	24
			60 (8·6%)

Another striking feature, borne out in the last war, is that there are very few obsessions (8%) which may be accounted for by the fact that war gives legitimate release to the aggressive impulses and at the same time relaxes moral standards, these two factors being the essential ones in the formation of obsessional conditions. The term "neurasthenia" (2%) we used in its stricter sense. "Psychopathic personality" (9%) was a term also used in a specific sense and not as a dumping-ground: it may be defined as "a disorder of a constitutional nature manifesting itself especially in anti-social behaviour." Half of the psychopathic personalities were of the schizoid type. There are only 3 out of 700 diagnosed as "psychoneurosis—effort syndrome," probably owing to the fact that many effort syndrome cases were placed in the anxiety group, to which they properly belong, and because many such cases were sent to Mill Hill Hospital for special investigation.

This table of diagnosis, and the figures based on it, cannot be regarded as scientifically accurate owing to the restrictions of the *Nomenclature* and of Service regulations. For instance, the term "depression" does not appear as a diagnosis of psychoneurosis because in the *Nomenclature* it is used only of psychotic states, the authors of this work apparently failing to recognize a depression of neurotic origin or reactive depression. When, therefore, the depression was obviously not psychotic it was sometimes placed among the anxiety states with which it was most commonly associated. Again, those diagnosed "psychotic" amounted to only 3.4% of the total; but that does not represent all the psychoses, for if a patient was diagnosed psychotic he had (at that time) to be discharged from the Service according to regulations; but there were some early psychotics (e.g., cyclothymic states in the older N.C.O.s) who were fit for more service and were often anxious to remain in the Army. They were therefore variously diagnosed—e.g., as temperamental instability (cycloid, schizoid, or paranoid type)—in order to keep them in the Service. Again, only 7 out of 700 were mental defectives; but this does not represent all the mental deficiency by any means, for when the deficiency was associated with marked instability or anxiety the patients were sometimes dealt with under these heads in order to facilitate the discharge from the Army when they were unsuited for the Pioneer Corps. Any future statistics based on the Army diagnosis of such cases are therefore bound to be misleading because of these strictures on diagnosis. But these inaccuracies are not sufficient to affect the broad generalizations mentioned above, such as the prevalence of anxiety states and the fewness of obsessional states.

Aggravation and Attributability to War Service

The practical problem as to how far these cases are attributable to, or how far they are aggravated by, war service is important from the point of view of pension, and also from that of psychological treatment, since old-standing chronic cases take longer to treat.

To assess the amount of aggravation we arbitrarily divided the patients, who numbered 332, into four groups:

1. No Aggravation (*Ag*−).—These were cases in which there was no aggravation at all or no appreciable aggravation from war service—that is to say, men who were neurotic before admission or those in whom the breakdown was due to nothing else than the ordinary conditions of Army life. Such are the patients of "limited adaptation" who could carry on satisfactorily in their work in civilian life so long as they were left to their tailoring or clerical work, but who could not adapt themselves to changed conditions, the discipline and routine of Army life, or the separation from home. *They numbered 32% of the whole.* Inasmuch as these men have broken down with no other stimulus than Army life, they are usually unfit for any form of military service, even civilian work in the Army. They should never have been recruited in the first place, or, having been recruited, should have been examined and segregated at the training depot, and forthwith discharged without admission to hospital. If they are sent to a general hospital their neurosis becomes hospitalized and they become worse, whereas if they are returned to their limited sphere of occupation they will settle down and do useful work.

2. Mild Aggravation (*Ag*+).—These cases include the men who were subjected to somewhat more severe conditions in Army life, such as a bomb falling in the neighbourhood (but in which the patient was not personally involved) or the evacuation from France but without particularly bad conditions. Such are the conditions of danger to which many civilians are now subjected. These conditions are not sufficient to break down an ordinary healthy-minded person, and probably operate by arousing old latent predispositions, such as infantile fear, or by bringing to light a constitutional instability. *These cases comprise 28% of the 332.* These patients are men of neurotic predisposition, some of whom have had previous nervous breakdowns of a mild nature. Most of them are unfit for general service; but in the more promising cases, though radical cure is impossible, that part of the neurosis which is due to war service may be treated with some success, without any attempt being made to reach the more chronic substratum of neurotic predisposition. Even with treatment they are unfit for front-line units, and the most we can do with them, as a rule, is, after a process of rehabilitation, to use them in the Army for trades and civilian occupations, a scheme for which is now in full operation.

3. Serious Aggravation (*Ag* + +).—This group includes those subjected to more serious conditions, such as being wrecked, or evacuated from Dunkirk beach under persistent machine-gun fire and bombing, but without being actually blown up or injured; or those who have been subjected to serious road accidents in which, however, there was no concussion. Pre-

disposing factors were often present in such cases, which accounted for their breaking down when many thousands undergoing the same experience did not. But in many cases the predisposing factors were not obvious, and had to be looked for. These patients were perfectly capable of doing their work adequately before service, and although they may have been of a nervous type they had never previously had a breakdown, nor had they been off work with a nervous disability. They are for the most part to be regarded as genuine war casualties. *Of these there were 21%.*

4. Attributable (Att.).—This group consists of cases in which the precipitating factor was all-important—mostly traumatic cases, the patients having been blown up, buried, concussed by injury from bomb or by shell fire, or involved in motor-cycle accidents. Often they were men who had never suffered from nerves, and had never been taken for, or had considered themselves, anything but normal. This does not mean that there was no predisposition, although in some cases none was found; in others it was found even though the patient at first seemed to be free from it. The precipitating factor, however, is the important one, and the predisposing factor, when present, was usually negligible. *Of these cases there were 19%.*

The classification of the 332 cases was therefore as follows:

TABLE II

Ag−	32%	60% (chronic cases)
Ag+	28%	
Ag++	21%	40% (acute cases)
Att.	19%	

From these figures it will be seen that 60% of our patients, whose cases were carefully scrutinized and examined by the Command specialists before admission, had had little or nothing to do with active service, whereas only 40% could be regarded as war casualties. These figures were taken over the Dunkirk and Norway period, and therefore represent a larger proportion of war cases than during the last six months of the year (1941).

The question "What is the cause of the disability?" (Army Form B179) is a peculiarly difficult one to answer in the neuroses, considering the complexity of the factors involved.

In order to help the medical boards in assessing the aggravation we usually described the patients under four categories: (*a*) "constitutional" (in the Army sense)—i.e., those with bad predisposition, whether strictly constitutional or acquired, such as the old chronic neurotics, whose condition was not materially aggravated by war service; (*b*) "constitutional, but aggravated by war service"—i.e., those in which there was material aggravation, but in which the predisposing factor was more important than the precipitating; (*c*) "bombing, etc., by enemy action in a person predisposed to neurosis," in which the precipitating factor was more important than the predisposing or constitutional factor; and (*d*) "bombing, etc., by enemy action," in which the predisposition was immaterial and the war experience was all-important. These four groups corresponded roughly to the Ag−, Ag+, Ag++, Att., but not entirely. This classification (the precise wording of which is immaterial) has proved of value to medical boards in assessing attributability.

Predisposition

How far are our patients predisposed to neurosis?

The question of predisposition is of importance from the point of view of attributability and from that of length of treatment. It is also interesting from a scientific point of view. An investigation was obviously called for. We found that of 326 cases there was a predisposition of a constitutional or an acquired type in 82% and apparently no predisposition in 18%; moreover, in 69% the predisposition was in early childhood, before puberty. Probably this is a low estimate of predisposition, for in most cases the investigation was on a somewhat objective basis, and there is little doubt that a more thorough analysis would have revealed a predisposition in most of the 18%, judging from the experience of cases in civil life, where the predisposing factors often reveal themselves only after considerable analysis, and may then prove to be of the greatest significance: indeed, in a more detailed and thorough investigation, mentioned later, only 3 out of 100 showed no psychological predisposition. This suggests that the precipitating factors, though important, seemed incapable, except in a few cases, of producing a neurosis unless there had been a predisposition. This is in keeping with what one finds in civilian practice, but the traumatic experiences of war led one to expect a larger proportion of these where breakdown was entirely due to the severity of present-day experiences. Of these there were very few even amongst the traumatic cases.

A striking feature of the cases in this war is the fact that so many of our patients *volunteered* the statement: "I have been nervous all my life: I have had depressed turns as long as I can remember." It was often said during the last war that the patients ascribed their condition to the war in order to get a pension. It is certainly not true of our patients to-day. So often did they volunteer the statement that we took statistics and found that nearly half (47%) spontaneously stated that they had had their symptoms before entering the Army. In others the same fact of a long history of neurosis was elicited by questioning and in subsequent analysis, but these were not included in the 47% given. But can we rely on the patients' statements? If they are not trying to get a pension, are they not telling a tale to get out of the Army, by trying to prove that they are useless as soldiers? That may be so, but it may also be nothing less than the truth that they *are* unfit to be soldiers, and ought never to have been in the Army; for thousands of neurotics are recruited who are not, never have been, and never will be fit to be soldiers.

As a "check up," however, on the truth of the patients' statements, we sent out a questionary to the parents of an unselected group of 40 (we found it impracticable to get the information from the doctors also, as we should have liked).

The following letter was sent, the exact phrasing of which is important:

> Dear ——,
>
> Your son is a patient under my care at this hospital. It would help me very much in treating him if you would tell me about any childhood illnesses he had—that is, whether he was delicate and difficult to bring up. Information which you think may have any effect on his health will be useful to me, and you might tell me something about the health of the family."

It will be observed that in this letter (drafted by Major E. Miller) signed by the medical officer in charge of the case we did not mention that the son was suffering from nervousness: no questions were asked about nervousness in childhood (but only regarding childhood illnesses, etc.) and no mention was made of the fact that this is a neuropathic hospital (although the parents may have known). The inquiry was therefore heavily weighted in favour of a negative reply.

In spite of this, 30 out of the 37 were confirmed by the parents' replies (7 confirmed, 18 substantially confirmed, and 5 confirmed and amplified). In 1 there was no information. Of the other 6, in four cases the parents obviously took the letter at its face value as referring to physical illness, and replied accordingly that he had had "whooping-cough at 3," etc. One was a case of homosexuality of which the parents were not likely to have been aware, and one a psychopathic personality and a chronic liar. In

every case, however (except the last, who couldn't be believed, anyway) the patient's statements were confirmed in the subsequent analysis. There was thus a very high confirmation rate from the parents and, one may say, a complete confirmation, from the patient's subsequent analysis, of the statements regarding early predisposition. It is obvious that these men were not inventing the story, whether to get out of the Army or not.

That does not mean, of course, that there is no "skrimshanking" among the soldiers. "Skrimshanking," if we may define it so, is making the most of symptoms we have, as distinct from "malingering," which is deliberately inventing symptoms we have not. Skrimshanking we found to be fairly common: malingering is, according to most experts in the last war and in this, comparatively rare, and is fairly easily detected. Patients exaggerate their symptoms for various reasons: but a common one found among neurotics is that the man has severe symptoms of pain, indigestion, and headache which are real enough, although hysterical, yet has so often been told that there is "nothing the matter with him" that he is compelled to exaggerate his symptoms in order to obtain the attention and treatment he requires.

The failure of the medical officer to recognize the neurosis as a definite disorder thus actually accentuates it, and the effect of treating the genuine neurotic as a semi-malingerer is to make him so. Many medical officers are disinclined to discharge the neurotic or the psychopathic personality because they object that he should "get away with it." For the medical officer to be thus swayed by his prejudices is to do a grave injustice to the commanding officers to whom such men are sent, and may endanger the lives of men with whom they are compelled to serve. It is just as criminal to send to a combatant officer an unreliable man of poor calibre who is likely to break down as it is to send him a defective gun or an untested plane.

Type of Early Symptom and Position in Family.—An investigation (65 cases) into the *form* of symptoms in early childhood revealed a multiplicity of such symptoms. Only five had one symptom alone, and the number of phobias, etc., averaged out at nearly five to every patient, pointing to a nervous *disposition* rather than to isolated conditioned fears. Only 8 out of 100 were the youngest child in the family, and there were nearly twice as many who were the oldest child.

Constitutional or Psychological?

Granting there is a predisposition, the next question is, "How far is this predisposition 'constitutional' and how far 'psychological'?" By "constitutional" we mean innate, endogenous, and dependent on the physiological and biochemical make-up of the individual; by "psychological" we mean acquired and due to environmental conditions, especially in early childhood—such as bad training, infantile fears, an unhappy home, or other experiences affecting his psychological disposition, with the formation of morbid complexes. The two factors often interact, but it is important to differentiate them on account of treatment; for we can give only palliative treatment for the constitutionally predispositioned, but can radically cure the psychoneurotic and acquired type since it is in the nature of a conditioned reflex. The amount of predisposition was found to be about equal: of 289 cases 49.4% were predominantly constitutional and 50.6% predominantly psychological.* In 10% both factors were significant and provided a bad prognosis, as we shall see.

A further investigation to determine the *extent* of the predisposition in each case, whether mild or severe, revealed that out of 193 cases 19% were mild and 28% serious constitutional, and 34% mild and 19% serious psychological.†

It will be noted that those who broke down with mild predisposition of both types (53%) are not very different in numbers from those who broke down with severe predisposition (47%). This is probably to be accounted for by the fact that there were more in the Army with mild predisposition than with serious, the latter having been excluded before reaching hospital. But what is of interest is that, whereas in the constitutional cases it was the serious more than the mild which tended to break down (28 as against 19), in the psychological or acquired it was those with mild predispositions which broke down in greater proportion than the serious. The total number of cases (193) is probably too small to have conclusions based on it, but, taking the figures as they are, how are we to interpret them?

There are many mild *constitutional* defectives in the Army who make quite a good showing as soldiers (we have met them as N.C.O.s, and one had gained the Military Cross), and therefore avoid detection. It is only when they have a serious constitutional disorder, whether mental defective or schizoid, that they come under the notice of the company officer for their peculiar behaviour. Moreover, the mild constitutional has less insight into his condition and is himself less aware of his disability, and therefore does not go sick. The man with mild *psychological* predisposition, on the other hand, is more aware of his neurotic complaint and is more vociferous in making it known. He is not sent to the medical officer; he goes. But there is a greater proportion of *serious* constitutional cases than there is of psychological because the serious constitutional, even if he has little insight into his own condition, is more easily spotted by the company officer for his clumsiness, inability to learn, anti-social behaviour, and bizarre conduct, and is sent to the medical officer. The man with serious psychological predisposition is more capable of disguising his disorder, if he wishes to, than is the constitutional, but the lower proportion of serious psychological cases is probably due to the fact that such men are disposed of before they reach the hospital stage.

Correlation‡ between Predisposition and Aggravation

As a rule the more the predisposition the less the aggravation necessary to produce a breakdown; the less the predisposition the more the aggravation necessary. This was proved in the following analysis of the 332 cases. Of those *not predisposed* 14% broke down with mild aggravation (Ag− and Ag+), and 86% broke down with serious aggravation (Ag++ and Att.). Of those *predisposed*, whether constitutional or psychological, 72.5% broke down with mild aggravation, and 27.5% broke down with serious aggravation. There was therefore an obvious inverse ratio between the amount of predisposition and the amount of aggravation necessary to precipitate the breakdown. This correlation is not inevitable, for there is no reason why a man of neurotic disposition should not be blown up like any other, in which case both the predisposing and the aggravating factors are important.

* The figures probably overemphasize the constitutional predisposition, since our investigation included not only the psychoneuroses, which by definition are primarily psychogenic and not constitutional, but cases of psychopathic personality, which by definition are constitutional in nature.

† One must, of course, take into consideration the fact that the estimates of what is a mild and what is a serious predisposition depend to some extent on the individual judgment of the specialists, and also that the criterion of judgment of what constitutes a mild or a serious disorder in the constitutional group differs from that in the psychological. But in the question under discussion this does not matter, as it is the difference in *ratio* between these which is under consideration.

‡ The term "correlation" is not used in too technical a fashion; it is intended to indicate a statistical correspondence between two items.

No explanation is given as to why the 14% with no predisposition should break down with only a mild aggravation, but the reason is probably either that there was an undetected, perhaps constitutional, predisposition, or that there were contributory factors, such as worries at home, which sapped the vitality. It would be interesting to investigate how far contemporary worries of this type contribute to the so-called "war neuroses." Our experience is that it is considerable, particularly in the way of "separation anxiety," men being worried about their families being bombed, their wives and other men, financial matters, or illness at home.

A further investigation into the amount of aggravation as related to (i) constitutional and (ii) psychological predisposition is of interest. In a group of 62 patients of both types who broke down with only a mild aggravation the proportion of constitutional to psychological was 3 to 1—that is to say, the constitutional patient as a whole breaks down sooner with a milder degree of aggravation than the psychological, who appears to stand up to it better, presumably because he has more courage. It takes less aggravation to affect a constitutional case than an acquired one, and the former subject cracks up more easily.

Previous Adaptation to Life

A further investigation was made into the important question of the patient's adaptation to life before he entered the Army. So many patients—for instance, persons of *limited adaptation*—got on perfectly well in their routine civilian life, but broke down when removed into strange surroundings of Army life, while others had always been misfits. How far could one anticipate a breakdown by reference to the individual's earlier objective history, which is so often accepted as significant of a neurotic tendency?

The following were the forms of adaptation for the first 100 patients:

TABLE III

	Ill Adapted (I.A.)	Limited Adaptation (L.A.)	Well Adapted (W.A.)
Physical (e.g., habitus, endocrine, etc.) ..	17	25	58
Mental (e.g., introversion, cycloid, etc.) ..	38	37	25
School	15	26	59
Work	8	31	61
Social	15	46	39
Army	31	28	41
Total	124	193	283

The following points may be noted:

1. Not by any means all of these psychoneurotics got on badly in the Army: 41% were well adapted to Army life, and many wished to remain in the Service; only 31% were ill adapted.

2. As regards civilian life, it was surprising to find how many were well adapted to school life and to work. 59% were well adapted to school life, and only 15% were ill adapted; while as many as 61% were well adapted and only 13% ill adapted to their work. School life and work together averaged 60% W.A., 28.5% L.A., and only 11.5% I.A.

3. On the other hand, the largest group of those ill adapted in civilian life were those *mentally* ill adapted (38% I.A., with 37% L.A. and only 25% W.A.), usually with constitutional peculiarities, such as the inferiors or schizoid.

4. In social life only 39% were well adapted; 46% were limited in their adaptation and 15% ill adapted. Mental and social together average only 32% W.A., with 41.5% L.A. and 26.5% I.A.

The conclusion to be drawn seems to be that in his *objective* adaptation to life and work the psychoneurotic patient shows up better (60%) than in his more subjective relations, such as mental and social adaptation (32%). Objective adaptation is therefore not a good criterion by which to judge whether a man is psychoneurotic (although it is of course of the greatest importance in judging mental deficiency), whereas mental and social adaptation are more dependable. A man may be a good and efficient worker while suffering from severe neurosis. A neurosis is not a failure in biological adaptation: the neurotic is one who cannot adapt himself to himself, and therefore to others.

As regards *physical* adaptation, 58% were well adapted and only 17% ill adapted, 25% being of limited adaptation. So far as it goes, this refutes the Adlerian view that organ inferiority is the exclusive origin of the neuroses.

(This paper will be concluded in our next issue.)

INTRAVENOUS SERUM IN THE TREATMENT OF PERIPHERAL VASCULAR DISEASE

BY

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One of the chief aims in the treatment of peripheral vascular disease is to aid the development of an adequate collateral circulation in the affected limbs. Good results have been obtained with passive vascular exercises by the Buerger method, alternating suction and compression by the pavaex boot, or intermittent venous occlusion, and it has been shown (Herrman, 1936) that an adequate collateral circulation can be re-established after all the major arterial pathways to a limb have been obliterated.

It has also been claimed that procedures which increase the blood volume stimulate the formation of a collateral circulation. Koga (1913) and Silbert *et al.* (1930) observed that the blood volume in patients with thrombo-angiitis obliterans was decreased. Koga (1913) gave saline or Ringer's solution intravenously, and reported striking improvement in 13 patients, with an increase in the peripheral circulation and diminution in both rest pain and pain on exercise. Silbert (1926, 1930) and Samuels (1936) have recorded good results following the intravenous injection of 300 c.cm. of 2 to 5% saline; the oscillometric readings in the legs increased, the legs became warmer, and trophic changes tended to clear up. The injections were given quickly—300 c.cm. in ten minutes—three times a week at first, and later at weekly intervals. The beneficial results of saline therapy have been confirmed repeatedly (Samuels, 1936).

The effects of intravenous saline on the peripheral circulation are presumably mechanical, produced by the immediate increase in blood volume. This increase is a transient one, lasting several hours only (Gilligan *et al.*, 1938), and it seemed probable, therefore, that if the blood volume could be increased for a longer period of time the effect on the peripheral circulation would be greater. For this reason the effects of increasing the blood volume by giving human serum intravenously were studied.

The serum used was pooled liquid serum, obtained from the North-East London Blood Supply Depot. It has a protein content of 7% and can be safely given to patients of any blood group without cross-matching. The amount

transfused each time was 800 c.cm. (two bottles), and the rate varied between 5 and 15 c.cm. a minute. Most of the transfusions were given without any untoward reactions, although several patients complained of transient lumbar pain during the early part of the procedure. Rigors were encountered in 15 out of 50 transfusions. The possible influence of these reactions in the interpretation of the results is discussed later.

Effects on the Circulation

The effects of the serum transfusion on the circulation have been studied in several ways.

1. *Changes in Blood Volume.*—These have been followed by means of frequent determinations of the haemoglobin and packed cell volume (haematocrit). The changes in blood volume following serum transfusion in normal patients as well as in those with peripheral vascular disease will be described more fully in a subsequent communication by Jordan and myself; the results in the patients reported here are given in Table I. After an initial increase, equal to the amount of serum injected, the blood volume gradually returns to normal over a period of from two to three days, although some patients appear to remove the added serum in twenty-four hours and in others it is retained for five days. The fate of the transfused protein is discussed later.

TABLE I.—*Changes in Haemoglobin (Hb) and Haematocrit (Hc) following Intravenous Serum*

Case		On Day of Transfusion		Days following Transfusion			
		Before	Immediately After	1	2	3	4
1	Hb	104	79	93	100	100	
	Hc	50	42	—	48·5	—	
2	Hb	97	90	90	99		
	Hc	48	43·5	42·5	44·5		
4	Hb	107	94	96	92	95	107
	Hc	51	45	44·5	44·5	44	47
5	Hb	98	84	91	90	93	94
	Hc	49·5	39·5	41·5	41·5	43·5	43·5
6	Hb	112	101	101	104	112	
	Hc	55	46	46	50	53	
8	Hb	114	102	93	95	103	110
	Hc	50	43·5	40	44	46	45·5
9	Hb	96	72	83	93		
13	Hb	91	87	87	95		

800 c.cm. of serum given in all cases except Case 1, which received 1,200 c.cm. All estimations on venous blood: Hb in % Haldane, Hc in %.

2. *Changes in the General Circulation.*—If the transfusion is given slowly there is usually no change in blood pressure, the pulse rate shows a transient increase of from 8 to 16 a minute, and there is no increase in venous pressure as judged by the degree of filling of the neck veins. These results agree with the findings of Altschule and Gilligan (1938).

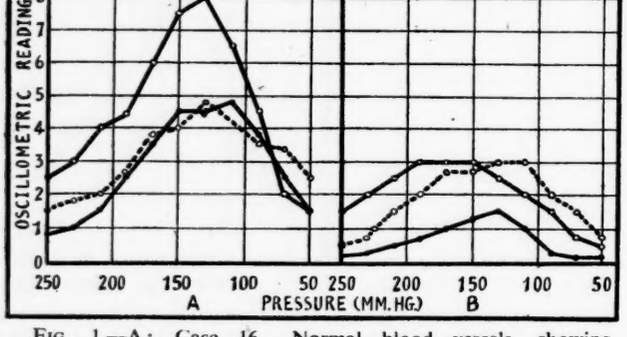

FIG. 1.—A: Case 16. Normal blood vessels, showing increased oscillometric readings after 800 c.cm. serum, returning to normal after 24 hours. B: Case 9. Arteriosclerosis. Initial oscillometric readings abnormally low; increased after serum, and have not returned to normal after twenty-four hours. ●——● Before serum. ○——○ After serum ○----○ 24 hours after serum.

3. *Oscillometric Readings.*—Measurement of the amplitude of the arterial pulsations in a limb is possible with the Pachon oscillometer, and measurements have been made before and at intervals after the transfusion. In patients with the distal type of obliterative arteritis, and with normal pulsations in the dorsalis pedis and posterior tibial vessels, increased oscillometric readings have been obtained at the calf and ankle immediately after the transfusion. This increase disappears after a period of from six to thirty-six hours. Patients with obliteration of the larger arteries and with small or absent initial oscillometric readings have shown only a slight increase after transfusion (Fig. 1).

4. *Changes in Skin Temperature.*—It has been difficult to measure changes in skin temperature occurring from day to day, owing to the many variable factors which it has been impossible to control, but most of the patients with peripheral vascular disease and cold limbs have shown clinical increase in warmth lasting for several days. The immediate changes in skin temperature following transfusion have been studied by means of a thermo-electric thermometer. If the legs are exposed in a cool room until equilibrium has been reached the injection of serum produces no significant change in skin temperature. When, however, the legs are warm the injection of serum produces a gradual rise in temperature of from 1° to 7° C. in one to two hours (see Table II).

TABLE II

Case	Maximum Oscillometric Readings			Temperature of Warm Limb (°C.)		Reflex Vasodilatation Maximum Temperature (°C.)	
	Before Serum	After Serum	24 hrs. After	Before Serum	After Serum	Before	After
1	1·75	2·5	1·5	—	—	31·6	33·2
3	3·25	6	4	34	36·8	34·9	36·4
4	2	4·5	—	—	—	(*a*) 33	36·4 (*a*) Rt. 1st toe
						(*b*) 24·7	34·4 (*b*) Lt. 1st toe
5	(*a*) 0	0	0	26·8	31	19	20 (*a*) Calf
	(*b*) 6·5	8·5	7				(*b*) Thigh
6	0	0	0	—	—	—	—
7	0	0	0	—	—	—	—
8	0	0	0	31·8	36	—	—
9	(*a*) 3	10	7	—	—	—	— (*a*) Rt. calf
	(*b*) 2·5	4	5				(*b*) Rt. ankle
10	0·25	0·25	0·25	31·6	33·6	22	22
11	(*a*) 0	0	0	26	33	19·2	20 (*a*) Ankle
	(*b*) 2	4·5	2·5				(*b*) Thigh
12	0·25	1·75	0·75	27·4	33·8	—	—
13	7·5	9	7	—	—	28·8	31·2
14	—	—	—	—	—	(*a*) 33·2	34·8 (*a*) Rt. 1st toe
						(*b*) 19·4	30·6 (*b*) Lt. 1st toe
15	—	—	—	—	—	17	31·9
16	4·5	7·5	5	31	32	—	—

5. *Response to Reflex Vasodilatation.*—It has been claimed that a more accurate impression of the state of the peripheral circulation in a limb may be gained by measuring the maximum degree of vasodilatation of which the limb vessels are capable. This may be produced by removing vasomotor tone by spinal anaesthesia, by local nerve block, or, reflexly, by heating the arms or trunk. This reflex method of producing vasodilatation in the legs by warming the arms and trunk has been used in the present investigation; the degree of vasodilatation has been estimated by measuring the changes in skin temperature with the thermo-electric thermometer. The response to reflex vasodilatation has been measured before and at intervals after the transfusion of serum (Table II), and the results in typical cases are shown in Figs. 2 and 3. In limbs giving a normal response (rise to at least 32° C.) before serum, the rise in skin temperature immediately after serum has been consistently greater by 1.5° to 3.4° C. (Table II). Failure to produce reflex vasodilatation in the vessels of the legs may be due either to a high degree of vasomotor tone or to organic arterial disease. Two patients with a high degree of vasomotor tone, with cold feet and intermittent claudication, were encountered. In one (Case 15) there was no rise in temperature of any of the toes before serum, even with prolonged heating of the trunk, whereas after serum a prompt normal rise in temperature was obtained. In the other (Case 14) the response of the right foot before serum was normal (rise to 32.4° C.), but the left foot remained cold throughout. After serum, the right foot gave a greater response (rise to 34.8° C.), and the left foot after a longer period of time showed a rise in temperature to 30.6° C. (Fig. 3). In

Case 4 the maximum vasodilatation which could be produced before serum was only enough to raise the temperature of the skin of the left toe to 24.7° C. There was a progressive increase in the response after each transfusion, and after two transfusions

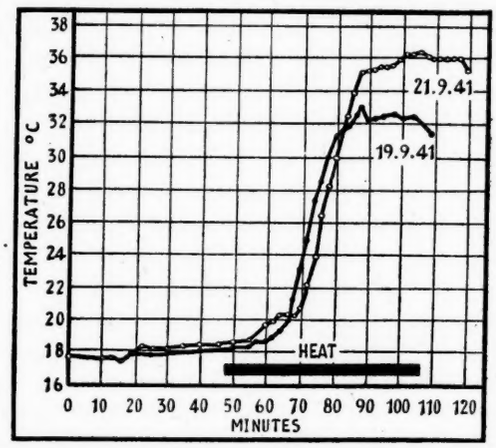

FIG. 2.—Case 4. Skin temperature after reflex vasodilatation, showing greater response immediately after serum transfusion. ●——● Before serum. ○——○ After serum.

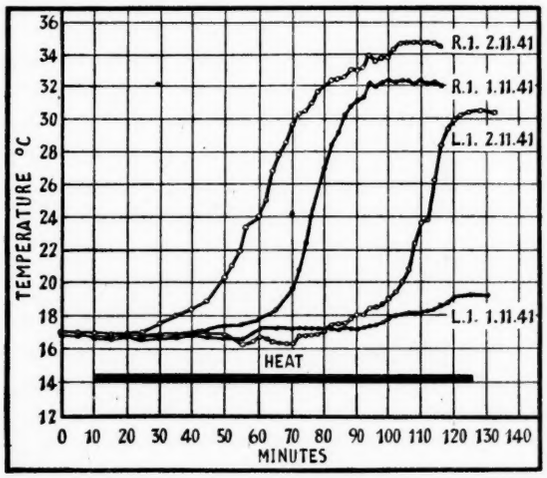

FIG. 3.—Case 14. Skin temperatures after reflex vasodilatation. Right first toe (R.1) shows normal initial response, with greater response after serum. Left first toe (L.1) shows poor initial response, with greater response after serum.

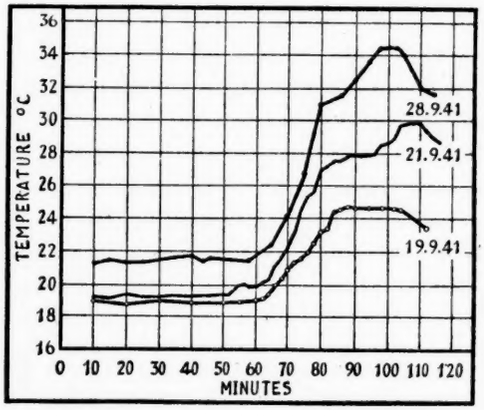

FIG. 4.—Case 4. Initial response of left first toe to reflex vasodilatation (19/9/41) characteristic of moderate arterial disease. Progressive increase in response after two transfusions of 800 c.cm. serum on 21/9/41 and 28/9/41.

a normal response was obtained (rise to 34.4° C.) (Fig. 4). In those patients whose blood vessels are incapable of dilating because of organic disease, the administration of serum could not be expected to produce any change, and none was observed. Cases 5, 10, and 11 belong to this group.

Clinical Results

Effect on the Warmth of the Skin.—An increase in warmth of those limbs with impaired blood supply has been a striking result of serum transfusion, and this has been associated with a diminution of postural changes in skin colour. The change was most pronounced in Case 9, and was associated with rapid healing of the ulcer of the foot. Cases 1 and 2, with a distal type of obliterative arteritis and gangrene of fingers, also showed striking improvement. In both of these patients the hands at room temperature were cold and cyanosed before transfusion. After transfusion the hands remained warm and red, and there was rapid separation of the blackened tips of the fingers. Two patients (Cases 5 and 11) with arteriosclerosis and absent pulsations in the dorsalis pedis and posterior tibial vessels and no oscillometric pulsations below the knee showed a similar improvement. In all, 7 out of 10 patients with cold limbs had improvement in the warmth of the limb; in the remaining 3 there was very little increase in warmth.

Rest Pain.—Eight patients had pain in the feet, which persisted during rest in bed. All were relieved of pain; in 6 it was complete after the first transfusion, and in the remaining 2 entire relief of pain was obtained after three transfusions.

Intermittent Claudication.—This was a prominent symptom in 6 patients (Cases 6, 8, 10, 12, 14, and 15). No. 8 lost his pain completely after the first transfusion; No. 12, who had failed to improve after two months of intermittent venous occlusion, more than doubled the distance he could walk before the onset of pain; and Cases 14 and 15 were considerably improved. Cases 6 and 10 showed no improvement after serum transfusions.

Raynaud's Syndrome.—Three cases were treated. Cases 1 and 2 were greatly improved, although Case 1 relapsed three weeks after transfusions were discontinued. Case 3 responded well to reflex vasodilatation immediately after transfusion but did not improve, the hands and feet on the following day still being cold and blue.

Ulcers Associated with Gangrene.—Pre-gangrenous colour changes in the skin were observed in 4 cases (Cases 4, 5, 8, and 10). All were definitely improved after two transfusions. Actual gangrene was present in 7 cases (Cases 1, 2, 6, 7, 9, 11, and 13), two in the hands and five in the toes or feet. The most striking improvement occurred in Cases 1 and 2, and was associated with a considerable increase in the temperature of the hands, the gangrenous tips separating rapidly and the fingers healing. Case 9, with a non-healing ulcer of the foot following amputation of the fifth right toe for gangrene, also improved rapidly. After the first transfusion the ulcer stopped discharging, and it subsequently became satisfactorily epithelized. Case 11, with gangrene of the toe, rest pain, and severe hyperaesthesia of the feet, lost both pain and hyperaesthesia after the first transfusion, and after one month of treatment the feet were warm and the gangrenous tip had separated. Case 13, with a perforating ulcer of the sole of the foot and diabetes, also improved, but here the effect of rest in bed and removal of the thick skin around the ulcer was probably the more important factor in healing. All of the 6 patients with ulcers of the limbs associated with chronic arterial disease recovered after from one to three transfusions. Another patient (Case 16), who had a deep non-healing ulcer of the leg of ten months' duration following a crush injury, was given weekly transfusions of serum. There was a pronounced increase in the oscillometric readings immediately after each transfusion (Fig. 1); the ulcer became cleaner and shallower, but after one month of treatment it was still not quite healed.

Discussion

In assessing the results of serum therapy reported in this paper it is important to determine how long the transfused serum remains in the circulation. In the absence of direct measurements of blood volume in man, indirect observations on changes in blood volume, and animal experiments where direct measurements are made, may be helpful. Freeman and Wallace (1938) measured the blood volume in dogs before, directly after, and twenty-four hours after transfusion of serum. They found that there was an immediate increase in blood volume corresponding to the amount

injected, but that twenty-four hours later the blood volume was almost back to normal, whether serum or saline was used. Similar results in the rabbit were reported by Scimone (1940). In animals, therefore, some mechanism exists whereby transfused serum, both protein and fluid, is removed very rapidly from the circulation. Observations on the present series and on normal subjects—which will be reported in greater detail in the further communication already mentioned—using the haemoglobin and haematocrit as a gauge of changes in blood volume, show that in most cases restoration of blood volume after transfusion of 800 c.cm. of serum takes place in from two to three days, although occasionally, as in animals, it may be complete in twenty-four hours. Similar results have been obtained by Hill, McMichael, and Sharpey-Schafer (1940) and by Harper *et al.* (1941).

The fate of the injected protein is interesting. None escapes as protein in the urine, and concentration of the blood to its original volume produces no increase in the plasma protein percentage, so that the added protein must be removed from the circulation. The ultimate fate of the transfused protein is still uncertain, but there is evidence from animal experiment that it may be utilized in body metabolism (Holman, Mahoney, and Whipple, 1934) or stored as unchanged protein or in the form of large aggregates of amino-acids (Howland and Hawkins, 1938).

If the serum is administered slowly the cardiovascular system adjusts itself to the increased blood volume readily. There is no increase of venous pressure, and in most cases the blood pressure shows no significant change. The extra fluid is presumably accommodated in the peripheral vascular bed by opening up new vascular channels. This mechanism should encourage the formation of a collateral circulation when the arteries are occluded, and would account for the promising results obtained in some of the cases here reported. The studies on skin temperature support this view. The greater rise in temperature with reflex vasodilatation after serum transfusion means an increased blood flow through the skin vessels, produced by the opening up of new vessels.

The oscillometric studies made on these patients have shown that in some of those with the distal type of obliterative arteritis an increased amplitude of arterial pulsation is produced by serum transfusion, and this alone suggests increased blood flow. Clinical improvement, however, was often observed when there was little or no change in oscillometric readings.

This work was started with the assumption that the action of serum would be largely a mechanical one, and the experimental evidence supports this view. Some of the transfusions caused rigors or a rise in temperature to 100–101° F. without rigor, and so it seemed possible that the beneficial results might have been due to the injection of small amounts of a foreign protein produced by the denaturing of serum proteins on storing. Injection of T.A.B. and other foreign protein has been used in the treatment of obliterative arterial disease with good results (Barker, 1931), but in the present series there has been no direct correlation between reactions and clinical improvement. When a rigor did occur, however, the additional vasodilatation may have been helpful in aiding the healing of ulcers or the separation of gangrenous areas.

The clinical results in this small group of patients with chronic obliterative arterial disease have been encouraging. Following the transfusion of serum the peripheral circulation in the affected limbs has been improved, as shown by the disappearance of rest pain, increased warmth of the foot, and rapid healing of ulcers and gangrenous areas. The use of intravenous serum would therefore seem worthy of extended trial in patients with incipient or developed gangrene of the extremities due to chronic arterial disease. The results in patients with intermittent claudication have been variable, some having been considerably improved and others showing no change. On the whole, the results are no better than have been obtained with hypertonic saline or intermittent venous occlusion, but when these fail it seems that in some cases serum is successful. For simple ulcers and non-healing wounds in normal limbs, it seems likely that the increased peripheral circulation following serum is of value. If the injected protein is stored or incorporated in the tissues, as is probable, this may be another factor in promoting healing (Ravdin, 1940).

Throughout this investigation serum has been used because it has a higher protein content than the plasma available. Liquid plasma may be more readily obtainable owing to the presence of numerous blood banks throughout the country, and, although it has a lower protein content and would therefore not produce the same increase in blood volume, it could be used.

The danger of drawing conclusions from clinical improvement in such a small series of cases is fully appreciated, and no claim is made that these results are necessarily better than those which might have been obtained by other methods. They are encouraging, however, and the experimental part of this paper shows that transfusion of serum increases the circulation in the affected limbs, so that some benefit might be expected.

Summary

Intravenous injections of serum have been used in the treatment of patients with chronic arterial disease. Those cases with incipient or actual gangrene have been improved, as shown by increased warmth in the limbs, disappearance of rest pain, and healing of any ulcerated areas. Gangrenous areas separated rapidly. Some patients with intermittent claudication had partial or complete relief of pain.

The action of intravenous injections of serum in stimulating the formation of a collateral circulation is probably a mechanical one, produced by the increase of blood volume which follows the transfusion. Oscillometric and skin temperature studies on the action of serum on the peripheral circulation are reported and these support this hypothesis.

Case Reports

Case 1.—Man aged 44. Raynaud's syndrome, obliterative arteritis, gangrene of finger. Cold fingers since 1935. March, 1941: blackening of both index fingers, healing slowly. July, 1941: gangrene of right middle finger. On admission, hands cold, going white on exposure to cold. Gangrenous tip to right middle finger. Radial artery thickened. B.P. 180/110. W.R. negative. Smoked 20 cigarettes a day. Given four weekly transfusions of 800 c.cm. of serum. Hands became warm and red after the first; the gangrenous tips soon separated and the finger was healed in two weeks after the first transfusion. Hands remained warm for three weeks after transfusions were stopped, and then relapsed.

Case 2.—Woman aged 56. Raynaud's syndrome, obliterative arteritis, gangrene of fingers. In 1940 for the first time hands became abnormally sensitive to cold, and were white and painful. Condition progressed until she was unable to hold anything in her hands because of pain. On examination the hands were cold and blue, with the tips of the left fourth and right third fingers ulcerated and the skin blackened. Thickening of both radial arteries. Legs normal. W.R. negative. Given 800 c.cm. of serum, and one week later 400 c.cm. Hands became warm and red after the first transfusion and the ulcers healed. Flexion became full and painless, and hands have remained in this condition for eight weeks without further transfusion.

Case 3.—Woman aged 37. Raynaud's syndrome. In 1928 chronic purpuric eruption on legs and non-healing ulcers on right calf. Raynaud phenomenon in hands and feet since 1931. On admission hands and toes blue and cold, with early trophic changes in the skin over the tips. B.P. 106/64. Tourniquet test negative. W.R. negative. Peripheral pulses present and equal. Ulcer on right calf practically healed. Blood count and platelets normal. Given three transfusions of 800 c.cm. of serum with immediate increase in temperature of hands and feet, lasting several hours each time, but

within twenty-four hours the hands were as cold as before transfusion. The ulcer healed rapidly in fourteen days.

Case 4.—Man aged 38. Thrombo-angiitis obliterans, gangrene of toes. Intermittent claudication both legs for 1½ years. One month before admission left third toe became painful and blue. General examination normal. B.P. 120/80. Hands normal. Feet warm; gangrene of left third toe. All peripheral pulses present and equal. Marked postural colour changes in foot, and reflex vasodilatation test showed moderate arterial disease in the toes with some vasospasm. W.R. negative. Gangrenous tip separated with rest in bed, but toes were still blue. Given 800 c.cm of serum twice—greatly improved response to vasodilatation test (Fig. 4). Colour of foot improved but only slight increase in temperature of feet.

Case 5.—Man aged 58. Arteriosclerosis, gangrene of foot. August, 1940: pain and redness of right big toe, worse on exercise and present at rest. December, 1940: gangrene of right fourth and fifth toes. Periarterial sympathectomy gave temporary relief, but in February, 1941, mid-thigh amputation of the right leg was performed. August, 1941: numbness and pain in left foot, with discoloration on outer side. Popliteal, dorsalis pedis, and posterior tibial pulses absent. B.P. 130/80. W.R. negative. Pain persisted with rest in bed. Given five transfusions of 800 c.cm. of serum. Rest pain disappeared after first, and foot became warm, with disappearance of the discoloured areas. Patient has remained well for two months after the last transfusion.

Case 6.—Man aged 37. Thrombo-angiitis obliterans, ulceration of foot. In 1935 intermittent claudication, gradually getting worse. Several attacks of phlebitis of legs. June, 1941: ulceration just below right medial malleolus. On examination toes of both sides bright red and warm, and sharply demarcated from rest of foot, which was pale. Small ulcer of right ankle. Femoral pulses present; all others absent in both legs. W.R. negative. Given three injections of serum. Feet became warmer, and ulcer healed; little change in the distance walked before the onset of pain in the right leg, but no pain in the left.

Case 7.—Man aged 49. Arteriosclerosis, ulceration of foot. In 1936 intermittent claudication. In 1938 bilateral lumbar sympathectomy—slight improvement. February, 1941: ulceration of left second and fourth toes, with rest pain. Ulcers remained unhealed for eight months. On examination brownish discoloration of lower part of left leg, with two small ulcers on second and fourth toes. Feet fairly warm. Arterial pulsations below popliteal absent on both sides, with no oscillometric readings. W.R. negative. Given 800 c.cm. of serum: immediate disappearance of rest pain, and ulcers were healed in ten days.

Case 8.—Man aged 59. Arteriosclerosis, intermittent claudication. In 1939 pain in right foot, followed by gangrene of toes. March, 1940: mid-thigh amputation of right leg. Femoral artery found to be occluded by grey organized thrombus. September, 1940: pain in left leg, present at rest and made worse by exercise—able to walk only twenty yards. Treated by diathermy and intermittent venous occlusion without improvement. General examination normal. B.P. 160/90. W.R. negative. Right stump healthy. Left leg warm but slightly discoloured on the dorsum and in tips of toes. Marked postural colour changes. All arterial pulses below femoral absent. Given 800 c.cm. of serum: able to walk over 200 yards afterwards without pain, and rest pain disappeared. Foot good colour. Slight recurrence of rest pain after three weeks, relieved by a further transfusion.

Case 9.—Man aged 62. Arteriosclerosis, gangrene of foot. July, 1940: gangrene of right fifth toe. February, 1941: admitted to hospital. Generalized arteriosclerosis. B.P. 136/80. Cyanosis and coldness of right foot, with gangrenous fifth toe. Left foot appeared normal. Arterial pulsations below the popliteal absent on both sides. Treated with perandren (testosterone propionate) 25 mg. twice weekly without improvement. June, 1941: amputation of right fifth toe and metatarsal. Healing fairly good at first, but small area 1½ in. by 1 in. on outer side remained ulcerated and discharging for six weeks. Given 800 c.cm. of serum; foot became warm and rest pain disappeared; two days later discharge ceased. Four further transfusions given; ulcer epithelized after second, and foot has remained warm and free from pain for two months.

Case 10.—Man aged 53. Hypertension, arteriosclerosis, intermittent claudication. July, 1941: intermittent claudication after walking 300 yards. Coldness and numbness of left leg when resting, and slight rest pain. On examination generalized arteriosclerosis. B.P. 160/100. Pallor of left first toe and bluish discoloration on outer side of this foot. Femoral pulses present; other pulses absent in both legs. Radiograph shows calcification of calf vessels. W.R. negative. Given two transfusions of 800 c.cm. of serum. Rest pain disappeared, both feet became warm and red, and the patient stated that walking was much easier, but no definite increase in claudication distance could be demonstrated.

Case 11.—Man aged 65. Arteriosclerotic heart disease, auricular fibrillation, gangrene of foot. April, 1941: intermittent claudication in right calf. Feet cold; pain in toes when resting. On examination generalized arteriosclerosis. Heart slightly enlarged; auricular fibrillation. B.P. 180/80. Both feet cold and blue, with severe hyperaesthesia. Early gangrene of tip of right first toe. Right popliteal pulse absent; dorsalis pedis and posterior tibial pulses absent on both sides. W.R. negative. Treated with intermittent venous occlusion for two months without improvement. Given 800 c.cm. of serum. Rest pain disappeared within three hours, bluish line of discoloration on dorsum disappeared and foot became warmer. Hyperaesthesia less. Two further transfusions given. Hyperaesthesia disappeared. No rest pain, and gangrenous tip of toe separated. Feet have remained warm and free from pain for six weeks after the last transfusion.

Case 12.—Man aged 52. Arteriosclerosis, intermittent claudication. In 1918 phlebitis both legs following pneumonia. In 1922 ulcers on legs, constantly healing and breaking down until 1934, when varicose veins were injected and ulcers healed. In 1935 intermittent claudication after walking thirty to fifty yards. General examination negative. Healing ulcers on both anterior tibial regions. No pulsations in main vessels of either leg. Legs warm and good colour. W.R. negative. Treated by Buerger exercises and intermittent venous occlusion for two months, with healing of ulcers but without improvement in the claudication. Given six weekly transfusions: able to walk 220 yards before onset of pain.

Case 13.—Man aged 75. Arteriosclerosis, diabetes, perforating ulcer of foot. Diabetes for twenty years, treated with insulin for past nine years In 1933 right third toe amputated for gangrene. January, 1941: perforating ulcer sole of left foot. On examination generalized arteriosclerosis. B.P. 180/105. Left leg definitely warmer than right, slightly swollen, and deep perforating ulcer present on sole of foot. Right foot cold and blue, but no gangrene present. Right dorsalis pedis present; other pulses at the ankle absent on both sides. Given 800 c.cm. of serum twice. Temperature of both feet was increased and the ulcer started healing, but no more quickly than would have been expected with conservative treatment and rest in bed.

Case 14.—Man aged 64. Arteriosclerosis, intermittent claudication. July, 1941: onset of intermittent claudication, gradually getting worse. Recent rest pain. General examination negative. B.P. 180/95. Radial and brachial arteries thickened. Both feet cold and blue, but no gangrene. Popliteal pulses present; left posterior tibial pulse present; other pulses at ankle absent. Response to reflex vasodilatation showed a normal rise of temperature in the right leg and no rise in left. After serum both gave good response, greater in the right (Fig. 3). Claudication distance increased from 400 to 1,200 yards after three transfusions.

Case 15.—Man aged 57. Obliterative arteritis, intermittent claudication. March, 1941: attacks of numbness in right first toe. September, 1941: intermittent claudication. History of syphilis in 1904. W.R. negative now. Smoked forty cigarettes a day. General examination negative. B.P. 130/90. Legs: feet cold, no gangrene or ulceration. Peripheral pulses all present and equal. No response to reflex vasodilatation before serum, but normal response after serum. Walking improved. Claudication distance increased three times.

Case 16.—Man aged 34. Crush syndrome, non-healing ulcer of right leg. November, 1940: buried as result of bomb explosion, and had severe crush injuries of both legs, followed by renal failure (crush syndrome). Deep non-healing ulcer on anterior tibial surface of right leg. September, 1941: ulcer in same condition. Wasting of calf muscles, anaesthesia of right foot, but arterial pulsations good. Given five weekly transfusions of serum. Slow but definite progressive healing of the ulcer.

No other treatment apart from rest in bed was given to these patients while they were receiving serum transfusions, and no attempt was made to stop them smoking.

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THE SELECTIVE BACTERIOSTATIC ACTION OF GENTIAN VIOLET

BY

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It was first shown by Churchman (1912) that gentian violet inhibits the growth of almost all Gram-positive bacteria in a concentration permitting the growth of most Gram-negative species. That susceptibility to this action varies remarkably even among closely related Gram-positive bacteria was shown by experiments of my own (Garrod, 1933) using several strains of each of six species of Gram-positive coccus, and media containing various concentrations of gentian violet, crystal violet, Hofmann violet, methyl violet, and dahlia. There was little to choose between these five dyes, and not much strain variation in resistance among the bacteria: a true picture of their behaviour could thus be obtained by averaging the whole of these results, which gave the following as the lowest concentrations completely preventing growth:

	Average Lowest Inhibitory Concentration	
	In Broth	In 5% Serum Broth
Streptococcus faecalis ..	1 in 58,000	1 in 46,000
,, salivarius ..	,, 180,000	,, 60,000
,, pyogenes ..	,, 220,000	,, 96,000
Pneumococcus		,, 105,000
Staphylococcus aureus ..	,, 1,239,000	,, 787,000
,, albus ..	,, 1,366,000	,, 1,113,000

It thus appeared that a medium, whether enriched with serum or not, containing 1 part in 500,000 of a violet dye should inhibit the growth of any staphylococcus and permit the growth of any streptococcus. That this was so was proved by experiment in both fluid and solid media and by their practical use for isolating streptococci from material also containing staphylococci in large numbers.

Gentian violet has sometimes been incorporated in media for such purposes as water examination, to prevent the growth of "spreaders." The aerobic spore-bearing Gram-positive bacilli are in fact more susceptible to violet dyes even than staphylococci (Garrod, 1936); hence a similar medium will eliminate another genus of bacteria which in some materials is apt to be troublesome.

This method of cultivation has recently been employed with success for the isolation of haemolytic streptococci from air and dust (Andrewes *et al.*, 1940; Bourdillon *et al.*, 1941; Thomas, 1941; Thomas and van den Ende, 1941) and from wound exudates (Colebrook and Francis, 1941; Francis, 1941). Although its value is thus established, the full capacity of such a medium for getting rid of unwanted bacteria is perhaps not generally recognized: there are other species, particularly liable to be present in dust, which it will eliminate. Since there is no published information about the behaviour of some of these, and a general re-study would afford a coherent picture not available elsewhere, the following experiments were made.

The Experiments

Method.—Agar plates were poured containing 5% of horse blood and various concentrations of gentian violet, obtained by adding a fixed volume from a series of solutions of different strength in distilled water: the concentrations throughout this series fell by one-third. The same batch of ox-heart extract peptone agar of *p*H 7.4 was used throughout, and the dye was the same lot of Grübler gentian violet as I used in 1933. The properties of this dye are apt to vary, and it is advisable, in using any lot not manufactured by Grübler, first to confirm that it exerts the desired action. The plates were ruled into compartments, and each of these was sown with a small loopful of a twenty-four-hour broth culture, the presence or absence of growth being noted after forty-eight hours' incubation.

Strains of Bacteria Used.—Gentian violet in concentrations of the order employed in these experiments has no inhibitory effect on most Gram-negative bacteria, which were therefore excluded. Those studied were Gram-positive species, whether pathogens, saprophytes, or altogether extraneous in derivation, that are apt to be found in wound exudates, on the skin, in secretions from the upper air passages, and in air or dust. The majority of the strains used were those which happened to become available from clinical material in the laboratory, and were thus of recent isolation. I am indebted to Dr. R. H. A. Swain for twelve strains of *Str. viridans* derived from cases of endocarditis lenta; other strains of this organism were obtained from sputum and saliva. All strains of *Staph. pyogenes* were coagulase-positive. Bacilli included seven strains of *B. anthracis*, several of *B. subtilis*, and one each of *B. brevis*, *B. megatherium*, *B. mesentericus*, and *B. mycoides*, for which and for several other cultures used I am indebted to the National Collection of Type Cultures. "Micrococci" included eight strains of *M. tetragenus* and three of *Sarcina lutea*. Corynebacteria included six strains of *C. diphtheriae* and sundry diphtheroids from the nose or throat and from wounds. It was thought impracticable to test fungi other than a few strains of *Monilia* and *Torula* owing to their great multiplicity of species, but quite low concentrations of gentian violet do in fact inhibit the growth of moulds.

Maximum Concentrations of Gentian Violet in 5% Blood Agar permitting Growth

	No. of Strains Tested	Concentration of Dye in Medium												
		1 in 26,600	,, 40,000	,, 60,000	,, 90,000	,, 135,000	,, 200,000	,, 300,000	,, 450,000	,, 674,000	,, 1,012,000	,, 1,518,000	,, 2,277,000	,, 3,415,000	,, 5,122,000
Str. pyogenes ..	16				9	6	1								
,, viridans ..	20	1	2	3	14										
,, faecalis ..	12			3	6	3									
,, pneumoniae ..	8				6	2									
Staph. pyogenes ..	18									9	7	1	1		
,, epidermidis	11											1	7	3	
Micrococci ..	11											1	5	3	2
Bacilli	20									2	8	5	2	3	
Corynebacteria ..	15									1	1	2	8	3	
Monilia and Torula	5											3	1	1	

The results, shown in the table, are expressed as the number of strains of each organism for which each concentration of the dye was the maximum permitting any growth whatever. In this and one or two succeeding lesser concentrations colonies were usually few, small, and atypical, in practice it is therefore advisable to use a concentration less than the maximum tolerated by the organism to be isolated. In such well-tolerated concentrations (e.g., 1 in 300,000 or less for *Str. pyogenes*) growth is typical, and haemolysis is produced as in dye-free blood agar. The use of many strains of each organism shows that there is considerable strain variation in resistance. There is no evident order of resistance among streptococci such as I deduced from experiments with five different dyes in broth and serum broth, but in the present study only a single dye was used in a solid medium containing blood.

Commentary

The striking feature in the table is that, despite variations in strain resistance, a wide gap separates all streptococci from all staphylococci, other indifferent Gram-positive cocci, diphtheroids, and the aerobic spore-bearing bacilli. Since to this more susceptible group are to be added moulds and yeast-like fungi, it follows that most of the non-pathogenic flora of air and dust can be eliminated by the employment of a gentian violet medium. Its other chief use is the isolation of streptococci from skin and wound exudates

containing so many staphylococci as perhaps to obscure streptococcus colonies in ordinary plates. Francis (1941) isolated haemolytic streptococci from 98 (32.7%) out of 300 specimens of wound pus on gentian violet blood agar, whereas on plain blood agar they were recovered from only 68 (22.7%) of these. He also observed that diphtheroids, which are often very numerous in superficial wounds, were completely inhibited. The medium used in recent studies for both these purposes—1 in 500,000 gentian violet blood agar—has been in use in my laboratory for ten years, and I have never seen any Gram-positive organism other than a streptococcus grow on it. The optimum concentration will vary somewhat with the amount of blood added, and may vary with different samples of the dye. It is important to secure a good one and verify its action: once identified it will last for years, since solutions are fairly stable and the quantity used minute; 10 grammes of the dye would furnish a dozen plates a day for over a century.

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A TUBERCULIN AND X-RAY SURVEY OF A GROUP OF ADOLESCENT BOYS

WITH SPECIAL REFERENCE TO MINIATURE RADIOGRAPHY

BY

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Case-finding in tuberculosis by means of tuberculin tests and radiography in groups of individuals has been carried out on a large scale on the Continent and in America—for example, the work of Heimbeck in Norway and Opie and McPhedran in the U.S.A.—but not to the same extent in this country. The objects of such surveys have been to determine the incidence of tuberculous infection as shown by the tuberculin test, and to ascertain the presence of latent or active lesions in the lungs.

The high mortality from pulmonary tuberculosis in Wales is well known, and it is reasonable to assume that the incidence of tuberculous infection is also high. We have had no recent definite knowledge of this.

Present Survey

Boys who volunteered for the Air Training Corps had to undergo a medical examination by individual medical practitioners, and we were later given the opportunity of carrying out tuberculin tests as well as clinical and radiological examinations of their chests. Altogether 437 boys aged between 15 and 18 years, from the county boroughs of Cardiff and Swansea, were examined and radiographed by us. Tuberculin tests were carried out in 385 of them, and in 239 cases a detailed comparison was made of full-sized (15 in. by 12 in.) and miniature (52 mm. by 42 mm.) films. On clinical examination suspicious physical signs were found in the chest in 6 cases; these included one of the two boys who were subsequently proved to have pulmonary tuberculosis.

Tuberculin Patch Test

The patch test was chosen owing to its simplicity and the speed with which it is applied. We failed to obtain the Vollmer patch (Lederle), which we had previously used, and had to substitute another preparation, which has given less well-marked reactions, as noted below. The instructions issued by the maker were carefully followed and the result was read on the fourth day.

TABLE I.—*Results of Patch Tests*

Total No.	Positive	Negative	Doubtful
385	141 (36·6%)	206 (53·5%)	38 (9·9%)

We consider that 36.6% of positive reactions is low for a highly urbanized area, and doubt if it is a true representation of tuberculous infection in this age group. In 1929 D'Arcy Hart (1932), using the graduated intracutaneous test, found that by the age of 16 years 70% of his controls of the hospital class in London reacted positively. In America, Hetherington, McPhedran, Landis, and Opie (1934) found that in a group of 1,081 schoolboys aged 15 to 19 years 79.6% reacted positively.

In 38 (9.9%) cases the result is given as doubtful; here the skin showed only one or two small vesicles, with no surrounding erythema, and we felt that to record these as either positive or negative would be unjustifiable.

The patch test must be considered less sensitive than the graduated Mantoux test, but we think that our low percentage of positive, and high percentage of doubtful, reactions may be partly due to the test material used.

Radiography

TABLE II.—*Results of X-ray Examinations (15 in. by 12 in. Films)*

Total No.	Active Pulmonary Tuberculosis	Require Further Observation	Calcified Primary Complex	Calcified Nodes	Normal Limits
437	2 (0·46%)	9 (2·06%)	5 (1·14%)	86 (19·68%)	335 (76·66%)

Only 2 (0.46%) cases were found to have active tuberculosis. This is not surprising, considering that in Great Britain it is in the subsequent age group that the disease becomes more manifest. We considered that 9 (2.06%) cases required further observation because their radiographs showed evidence of former basal pleurisy, widely diffused hilar shadows, or localized indefinite shadowing. Only in 5 (1.14%) cases were calcified primary complexes found. By "primary complex" we mean an initial tuberculous focus with involvement of the associated lymph glands.

In 86 (19.68%) we agreed that calcification of hilar glands was present. Israel, Hetherington, and Ord (1941), in America, found that out of 643 prospective nurses aged 17 to 21, 59 (9.2%) showed calcification in their *x*-ray films. It is interesting to note here that of the boys whose films showed hilar calcification 36% were positive to the patch test, 57% negative, and 7% doubtful.

Miniature Radiography

The technique used was that described by A. L. Cranch (1940), who was responsible for the miniature radiographic work. In 239 cases both full-sized and miniature films were taken. The tube distance for the large films was 5 feet, and for the miniatures 3 ft. 4 in., the respective exposure times being one-tenth and four-tenths of a second.

Had these factors been the same for both methods the film comparisons would have been fairer.

The miniature radiographs were carefully examined with a magnifying viewer before the large films were read. Of the miniature films, one showed active pulmonary tuberculosis (the second case of active tuberculosis did not have a miniature film taken)—the large film did not add to our knowledge of this case; 2 left us in doubt as to the condition (here the large film simply confirmed our opinion that these cases required further observation); 4 others showed minute apparently unimportant shadows, and the large films confirmed the absence of any significant lesions. We consider that as the method of miniature radiography is still in its infancy it is advisable to take full-size films where definite or doubtful lesions are seen. Careful comparison of the 239 full-size and miniature films showed that the latter did not miss anything of importance. Calcified hilar nodes were more easily recognized as such in the full-sized films: this is probably explained by the difference in the distance and exposure factors already mentioned.

The number of miniature films so far examined by us is too small for a final opinion, but we feel that the results are promising. With further technical improvement and increased interpretative experience miniature radiography will take a leading place in the campaign against tuberculosis. The speed with which the films can be taken, the reduction in filing space, and, after the initial cost, its cheapness, make this method, together with tuberculin testing, the ideal for a case-finding survey.

Our thanks are due to Prof. W. H. Tytler, Director of Research to the Memorial Association, for his valuable advice and assistance. To Dr. D. A. Powell, principal medical officer, we are particularly indebted for his guidance throughout.

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ORBITAL CELLULITIS FROM GAS-PRODUCING ORGANISMS

BY

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Orbital cellulitis caused by gas-producing organisms is a rare occurrence. I have been unable to trace any reports of it in the recent literature. In the following case the condition arose from infection of the nasal sinuses.

Case Record

A maltster aged 67 was admitted to the Tennent Institute on September 27, 1941. For five days he had complained of very severe pain in the right eye, and the lids had become grossly swollen. Small incisions had been made in the outer third of both eyelids close to the upper and lower orbital margins. Brown pus and bubbles of gas were escaping from the wounds. The smell was so foul that it was difficult to remain in the room. The proptosed globe was immobile, and purple folds of conjunctiva were overhanging the margin of the cornea, which was intact. The patient was very ill. On the day after admission right antral lavage was carried out by Mr. Fulton Christie, and was positive. This was repeated every few days over a period of six weeks. Disease of the right antrum and right ethmoidal cells was revealed by radiographs. On September 29 the anterior end of the middle turbinate was removed. A radical antral operation (Caldwell-Luc) was deferred until November 7, when the patient was stronger. Anti-gas-gangrene serum and sulphathiazole were used from the outset, both intravenously and intramuscularly. The details are shown in the table. In four days the patient was feeling better. His temperature, which had been 100° to 101°, came down to normal. The swelling of the lids subsided very slowly, and the cornea, which had developed a marginal keratitis, healed. The proptosis receded, and on November 11 it became possible to examine his fundus. The optic nerve was found to be atrophic. There was no evidence of haemorrhages or exudates.

Week	Anti-gas-gangrene Serum	Sulphathiazole	Operations	Blood Picture, etc.
1st	Three preliminary doses of 277 units at ½-hourly intervals. A total of 86,000 units (i.v.) and 24,000 units (i.m.), spread over three days	2·3 gm. (i.v.) over 48 hours; 4 gm. (orally) 4-hourly for remainder of week, with one day's rest, totalling 40 gm. orally	+antral lavage three times. Turbinectomy and curettage of ethmoids	*Group B*, i.v. glucose saline drip for 48 hours. W.B.C. 18,000 on 28th, W.B.C. 15,000—85% neut., 14% lymph—on 30th
2nd		4 gm. orally 4-hourly for the first 3 days, with one day's rest, followed by 1 gm. orally 4-hourly, then stopped	+antral lavage three times	Hb, 80%; R.B.C. 4,000,000; W.B.C., 9,000
3rd			+antral lavage three times	
4th			+antral lavage twice	
5th			+antral lavage twice	
6th			Radical antral operation (Caldwell-Luc)	

The bacteriologist reported the presence of various cocci and a few Gram-positive bacilli from a smear and, on culture, *Staphylococcus aureus*. In a later stab culture we found a Gram-positive bacillus with filamentous forms, some of which showed swellings resembling spores. The clinical picture of gas bubbling from the wound was a fact which does not conflict with the equivocal findings of the cultures.

The right eye was completely blind, there being no perception of light. The visual acuity of the left eye was 6/6 and Jaeger 1 with a hypermetropic correction. The field of vision was full. There was no evidence of uveitis in either eye. The patient had bilateral nerve deafness from a shell-burst in 1916. The Wassermann reaction was negative. The clinical diagnosis was confirmed by Mr. T. Murray Newton.

Discussion

This case is put on record because of the extreme rarity of gas infection of the orbit. Cross (1941) reported 12 cases of gas gangrene following perforating wounds of the globe, in all of which the eye was lost and the patient recovered. In infection of the orbit the venous channels available for dissemination are numerous, and recovery is less easily understandable than in an infection limited to the globe.

There is now no paretic limitation of movement of the eyeball in the above case, and we may infer that there has been no gangrene of muscle. The surgeons of the last war (Fraser, 1919) differentiated clearly between gas infection of the wound and infective necrosis of muscle. In wound infection alone pain was less, the smell was less, the patient was usually not so gravely ill, and the outlook was better. But there would seem to be no picture of convincing constitutional signs pointing to muscle necrosis, and the proof is in surgical exposure. The decision is important to the general surgeon. Excision of affected muscle is considered essential, while exploration of gas cellulitis is needless. In the orbit this difficulty does not arise. The muscle mass is small. Further, the technical difficulty of exposing the whole muscle cone in order to inspect it convincingly would be great. The incisions would have to be very wide and would open up the fascial

planes of the scalp and the face. Small drainage incisions within the upper and outer and the lower and outer margins of the orbit seem to be all that is necessary.

The cause of optic atrophy in such a case is obscure. The suggestion that the nerve becomes atrophic as a result of mechanical stretching is unlikely. Orbital infections may give rise to a perineuritis in which the dural sheath shows little change, but the leptomeninges reveal hyperaemia and perivascular infiltration which extends along the fibrous septa of the nerve. The pia may be destroyed or may become fibrosed and adherent to the dura. A purulent optic neuritis may result from orbital infection (Cheney, 1923). The eye is usually lost in such cases whether the origin is from orbital sepsis, from metastatic infection, or from meningitis.

The literature on rhinogenic optic neuritis is controversial. Confusion arises because the blindness may clear in whole or in part whether the sinus disease is treated or not. Smith (1939) quotes two cases in which ethmoiditis gave rise to papilloedema with slight concentric contraction of the field and enlargement of the blind spot and no loss of central vision. This was not an optic neuritis but a true papilloedema which subsided after the nose was treated. The occurrence of papilloedema is probably dependent upon the situation of the toxic oedema. If this is in the part of the nerve close to the globe the central retinal vein may be pressed upon, resulting in papilloedema. On the other hand, if the oedema affects the deeper part of the nerve the retinal vein may escape. It is curious that the rhinogenic toxin should fail to affect the vulnerable papillo-macular bundle in Smith's cases. On the whole, grave sinus disease is very seldom accompanied by any sign of optic neuritis. The nerve sheath, like the intact dura in head wounds, must be a powerful barrier to infection, yet the causative factor invoked to explain the local spread from sinus to nerve is often some slight or chronic affection and the thinness of the lamina papyracea, or thrombosis of venous channels in connexion with the sheath, or the suction effect of "vacuum sinusitis." It may be that the role of the infected sinus in optic neuritis is similar to that of any other septic focus whose circulating toxins may give rise to uveitis and, less commonly, to optic neuritis.

As there was no preceding optic neuritis and no sign of uveitis in the above case, we may assume that the infection had not spread from the globe to the nerve. Atrophy of the nerve was observed a fortnight after the onset of the illness. The findings may be reasonably explained by an exudative perineuritis or neuritis with early thrombosis of the nutrient vessels, the posterior part of the orbital optic nerve being affected.

Summary

A case of orbital cellulitis from gas-producing organisms is recorded. There was coincident disease of the nasal sinuses.

Anti-gas-gangrene serum and sulphathiazole were used and details of dosage are given.

The patient recovered, but the optic nerve was atrophic. Certain pathological processes are discussed.

I am indebted to Prof. W. J. B. Riddell for advice in the preparation of this paper.

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The issue of the *Schweizerische medizinische Wochenschrift* for November 1, 1941, is a Festschrift in honour of Dr. Robert Doerr, professor of hygiene and bacteriology at Basle and author of works on psittacosis, typhus, dysentery, and anaphylaxis, on the occasion of his seventieth birthday.

Medical Memoranda

Sulphonamides for Ulcerative Endocarditis due to Type 4 Pneumococcus

For many years cases of pneumococcal endocarditis have been recorded, and this condition is now recognized as an uncommon complication of lobar pneumonia. Fishkin and Pilot (1940), in a survey of the literature, found that in pneumococcal endocarditis Types 2 and 5 most commonly recurred, although isolated cases of endocarditis due to Types 4, 7, 8, 11, 12, 20, and 29 of the pneumococcus were on record. Rakov (1939) reported a case due to Type 18. Terry and Beard (1940) recorded a case of pneumococcal meningitis treated by sulphapyridine, and although this illness terminated fatally with endocarditis the examination of the cadaver showed morphologically that the meninges at this stage were clear of any exudate. Huber, Lièvre, and Payet (1939) reported a similar case in which sulphapyridine undoubtedly prolonged life.

The following case was treated with sulphapyridine and sulphathiazole, and clinical improvement resulted with both drugs. In spite of this improvement Type 4 pneumococcus was isolated from the blood two days before death, during a course of treatment by sulphathiazole.

CASE REPORT

The patient, a man aged 36, was admitted to hospital on April 25, 1941, and was confined to bed throughout his illness. There was no history of any recent or previous illness or of local injury. He complained of shivering, cough, and pain in the chest of thirty-eight hours' duration. On examination his breathing was laboured and his lips were blue. Pulse 100, respirations 30, temperature 102°. There was impaired resonance at the left apex of the lung and at both bases, with numerous coarse rales in these areas. No clinical enlargement of the heart was discovered; the sounds were clear. No abnormal constituents were found in the urine on admission. A diagnosis of bronchopneumonia was made, and 6 grammes of sulphapyridine was given daily, also continuous oxygen.

29/4/41.—Restless. Severe headaches. Some neck rigidity. Cerebrospinal fluid turbid but under normal pressure. Pathological report: 1,600 cells per c.mm.; Gram-positive diplococci; culture sterile.

The sulphapyridine was continued, and the meningeal and chest signs cleared rapidly.

5/5/41.—Temperature normal. Feels well. No signs or symptoms.

8/5/41.—Sulphapyridine stopped. Altogether 64 grammes on the last six days in reduced doses.

9/5/41.—Sudden acute pain in the left chest. Cyanosis. Temperature 102°. Heart slightly dilated, with diffuse systolic bruit. Impaired resonance at both bases.

12/5/41.—Temperature 102°. Good colour. Physical signs unchanged, but patient more comfortable.

19/5/41.—Heart dilated, the left border being two inches external to the mid-clavicular line. A loud and widely conducted systolic bruit was audible. No thrill. Basal congestion of the lungs. Oedema of the feet. Radiograph revealed left ventricular dilatation. Blood culture: pneumococcus Type 4 isolated. Sulphathiazole 4 grammes daily was started, with immediate clinical response. The temperature fell and the patient was more comfortable.

23/5/41.—Blood culture: pneumococcus Type 4 isolated. Urine contained sulphapyridine crystals.

25/5/41.—Two convulsions, the second terminating fatally.

Post-mortem Examination.—Heart: Weight 18 oz. Left ventricle dilated and thinned. Aortic valve: Pale yellow stalactite vegetation on the ventricular aspect of the cusps, spreading on to the adjacent endocardium. A fairly large perforation was present in the centre of the vegetative mass (pneumococcus isolated). Mitral valve: Old fibrous thickening of valve and fine warty growths on upper surface of anterior cusp. Thoracic and abdominal aorta both showed yellow streaks of fatty degeneration on the intima. Pulmonary valves: Normal in structure. Brain: Considerable oedema of leptomeninges.

A large mass of greenish-yellow pus was found on the vertex near the median fissure (pneumococcus isolated). Base of brain clear. No arterial emboli or areas of softening seen. The brain was congested and oedematous. The ears were dry. The spleen was soft. Cause of death: ulcerative endocarditis, septicaemia.

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Crush Injury with Renal Failure: Recovery

The recent interest shown in cases of renal failure after crush injuries makes the following report worthy of record.

CASE REPORT

The patient, a man aged 20, was buried in the basement of a house on September 8, 1941. He was pinned down, lying on his side, with debris pressing chiefly on his left thigh and right forearm. He was dug out after eight and a half hours, and reached hospital at 9.30 a.m. He was thin, anaemic, and poorly developed, but his general condition then gave rise to no concern. He complained of pains in his back, legs, and right arm. The temperature was subnormal, the pulse 100. He passed urine containing blood.

At 11 a.m. he collapsed, his pulse rose to 140, and he sweated profusely. The systolic blood pressure was 90. Restorative measures were started—hot-air cradle, raising the foot of the bed, and a pint of plasma was given intravenously. By noon his pulse was 130 and the blood pressure 110/70. Morphine 1/4 grain was given, and the plasma drip was continued until a total of two pints was reached. He vomited once. At 2 p.m. his pulse was 140, but of good volume, and he was obviously improving. He could move both legs slightly, though with pain. The abdomen was soft, moved normally, and showed no rigidity. There was a short systolic murmur, most audible at the base. Curious patches of erythema, almost like erysipelas, appeared on each buttock and were thought to be due to compression; these persisted for three days. At 7 p.m. his pulse was still 140, and he was sweating; he vomited back fluid soon after taking any drink. A rectal drip saline was started, and he was given a further 1/4 grain of morphine. He slept fitfully. During September 9 his pulse varied from 140 to 170; he felt better and had no pain, the right forearm and left thigh were swollen, foot-drop was present, but the radial and anterior tibial pulses were palpable. The urine passed was scanty (12 oz.) and still contained blood. On the 10th his general condition had improved; the pulse had dropped to 120, but vomiting continued, 10 oz. being returned out of a total of 40 oz. taken. No urine was passed. He had no desire to micturate, nor was the bladder full. He slept better and continued to drink well. On the 11th the pulse dropped to 92, he made no complaint except of numbness in the left leg; vomiting continued (regurgitation of part of the fluid taken). At 7 p.m., having passed no urine for forty-eight hours, and there being no sign of the bladder filling, one pint of glucose saline was given intravenously, together with 2 c.cm. of mersalyl. Two hours later he passed urine; altogether 32 oz. was passed in the three hours following the injection. It was free from blood, but contained a moderate amount of albumin. On the 12th his condition was satisfactory; the pulse was 80 to 90, vomiting had ceased, and the urinary output was 24 oz.; alkalis by the mouth were started. Since then his condition steadily improved; the albumin disappeared, and he began to take food readily.

On October 4 the oedema had gone from both affected limbs, but there remained in the flexor muscles of the right forearm a patch of swollen tender tissue, roughly 3 in. by 1 in. Full extension of the wrist and fingers was difficult and painful. A similar condition existed in the hamstrings of the left thigh, and foot-drop was still present. These disabilities were dealt with by splinting, massage, and exercises. The condition was exactly comparable to that seen in Volkmann's ischaemic contracture.

E. J. BRADLEY, F.R.C.S.Ed.

Reviews

THE STUDY OF SYMPTOMS

Symptoms in Diagnosis. By Jonathan Campbell Meakins, M.D., LL.D. (Pp. 323: illustrated. No price given.) Boston: Little, Brown and Co. 1941.

Prof. J. C. Meakins's *Symptoms in Diagnosis* is in itself a symptom of a changing attitude in medicine. "What the patient says is not evidence," is no longer a maxim in diagnosis. It is true, as he says, that this book alone will not lead to an immediate diagnosis, but it is equally true that the interest in the pathogenesis of disease and the introduction of laboratory methods have led in the recent past to an under-estimation of the value of interpreting symptoms. Yet they are the expression of disturbed reflexes which often antedate the appearance of objective signs. So, rather tardily, the importance of a detailed history is becoming realized. Pain is the symptom which most frequently drives the patient to seek medical advice, but it remains the symptom which is most difficult to assess. It is appropriate, therefore, that considerable space is here given to its consideration, but surprising that the important subject of referred pain is dealt with rather summarily. No reference is made to the classic researches of Henry Head on this or to those of Hurst on tension as the effective stimulus to visceral pain. Nor can this omission be attributed to a desire not to cumber the text with too many references, for the earlier theories, largely speculative, of Ross and of Mackenzie are alluded to. The account of the more recent researches of Thomas Lewis and Kellgren is not very clear. The subjects of respiratory symptoms and muscular fatigue are fully treated, though here the approach is physiological rather than clinical. The photographs of a case of progeria contrasted with one of anorexia nervosa bring out a point often overlooked in the diagnosis between these conditions—while the subject of the former looks much older than her years, the sufferer from the latter has a childish expression that belies them. In the discussion on oedema (which surely is a sign rather than a symptom) the author rightly emphasizes the important factor of chronic peritonitis in ascites of hepatic origin, but mentions the lack of bacteriological evidence in the fluid. H. E. Durham did, however, find such evidence in cultures from the omentum. Prof. Meakins resolves the old controversy as to the exact part played by alcohol in the production of cirrhosis of the liver. Experimentally, alcohol by itself has never produced this lesion, but he points out it can do so in the absence of vitamin B complex, which protects the liver. This is interesting in view of the proved association between alcoholic neuritis and lack of vitamin B_1.

Doubtless to write a book devoted to the study of symptoms is no easy task; in some respects the present one is rather superficial and tends to encourage the practice of list-making beloved of candidates but disliked by their examiners. If we have been somewhat disappointed, Prof. Meakins must take it as a compliment that from one of his established reputation a high standard is naturally exacted.

ELEMENTS OF GYNAECOLOGY

Essentials of Gynecology. By Leo Brady, M.D., F.A.C.S., and Ethna Louise Kurtz, R.N. (Pp. 257. 12s. 6d. net.) New York and London: The Macmillan Company. 1941.

This little book is written for nurses, but is so excellently produced and contains such a wealth of information of practical value that it can be warmly commended to students and to doctors interested in the practice of

gynaecology. A copy available for the nursing staff in a gynaecological theatre or ward would be much appreciated and promote a more efficient service. The authors are a senior consultant and a senior sister in charge of a genito-urinary unit, and because of their intimate knowledge of the difficulties that may arise in a gynaecological service they write with authority. They believe with Moynihan that the patient is the only important person in the theatre, and they believe also that the best results are achieved only by careful team-work. It is emphasized that in this team the ward-maid and charwoman as well as the nurses and doctors have an important place to fill. There is no room for sloth or carelessness, or for fears and anxieties. It is realized that a nurse is fearful usually because of inexperience or ignorance, and with this important fact in view the authors have in masterly fashion so handled their subject that the nurse is told what to do and, even more important, why she should do it. If she remembered all that was written in this book the nurse or sister would have a very wide practical knowledge of the subject. This is so true that with no hesitation or apology the volume can be recommended to students, who would find it both interesting and highly instructive.

The contents are arranged in fifteen chapters, which, beginning with "The Anatomy and Physiology of the Female Generative Organs," continue with an account of history-taking and the technique of examination, and an excellent summary of gynaecological infections, genital misplacements, extra-uterine gestation, sterility, and tumours. The concluding six chapters are devoted to gynaecological surgery, post-operative care and complications, theatre equipment and technique, and a very helpful account of the relation of urology to gynaecology. With the exception of Fig. 12, which shows the ungloved hands expressing gonococcal pus from a urethra, the illustrations are good.

MALARIA CONTROL BY ANTI-MOSQUITO MEASURES

Malaria Control by Anti-Mosquito Measures. By Gordon Covell, C.I.E., M.D., D.P.H., D.T.M.&H., Lieutenant-Colonel, Indian Medical Service; Director, Malaria Institute of India. Second edition. (Pp. 224. 12s.) Calcutta: Thacker, Spink and Co. (1933), Ltd.; London: W. Thacker and Co. 1941.

Methods of malaria control dependent upon destroying or preventing the breeding of the anopheles mosquito or protecting the human host from its bites have developed very greatly in recent years. So much so that even the most experienced require at times some book they can use for reference, while with the beginner a book upon which he can rely for information and guidance is a necessity. Both types of reader will find the ideal book for their purpose in the recently published second edition of Colonel Covell's *Malaria Control by Anti-Mosquito Measures.* The first edition of this work was a small book published some years ago in India. It was remarkable for the simple clarity of its arrangement, its conciseness, and its completeness. The second edition retains all these characters. It is published in Calcutta and London, enlarged, brought completely up to date, and still remains very modest in price. One can truly say that within the field covered by the title nothing is omitted. Here one finds under measures of personal protection information about mosquito nets and netting, recipes for repellants, and information regarding wire-gauze and screening, size of mesh, durability of different gauzes, and so on. Under measures directed against the adult mosquito are expounded mosquito traps, a number of which are described, fumigation, sprays, and other methods. Under action against the larva are all those important matters connected with anti-malarial drainage: oiling, how to select and apply oil, paris-greening, requirements of a good paris-green, how to mix and apply paris-green, and so on throughout the whole field of anti-larval control. Following the final section giving the most recent and up-to-date advances and usages is a bibliography of 1,148 references. This is no mere appendix but an essential part of the author's excellent method. It is divided under different headings relative to different subheads in the text, so that if one wishes to supplement what is given in any particular subhead there one sees at a glance, aided by the text, what further sources of information there are.

Now that the war has sent troops all over the world and malariologists are likely thereby to be called upon to deal with all sorts of situations connected with the control of malaria, it seems very fortunate that this excellent work has now been made available in its new form and still at so moderate a price.

DICTIONARY OF APPLIED CHEMISTRY

Thorpe's Dictionary of Applied Chemistry. By the late Sir Jocelyn Field Thorpe, D.Sc., F.R.S., and M. A. Whiteley, D.Sc. Fourth edition. Volume V. (Pp. 610; illustrated. 70s. net.) *An Abridged Index to Volumes I-V.* (Pp. 19. 3s. net.) London: Longmans, Green and Co. 1941.

Volume V of the fourth edition of *Thorpe's Dictionary of Applied Chemistry* is now ready. The range of alphabetical titles extends from Fehling's Solution to Glass, and includes among the more important monographs the subjects of fermentation (alcoholic), fertilizers, fibres (natural and artificial), fireproofing of wood and fabrics, food preservatives, fuel and gas (coal). *Thorpe's Dictionary* has always held a high place in the esteem of chemical practitioners. The call for a new edition may be taken as a measure of the appreciation in which it is held. The success of former editions has not, however, left the authors content to stand still. They have been active in the preparation of emendations and additions, which indeed are necessary in the present day of swift changes in chemical technology. The new matter includes plentiful references to published articles and papers, and these appear to be completely representative of new work. Many of these references concern matters of specialized rather than of general interest, and are properly dealt with by way of reference instead of being made a cumbrous addition to the text of the volume. The articles on food preservation and food preservatives are typical of the thorough manner in which the authors have succeeded in combining voluminous information with instructive detail and presenting the whole in a form which enables the reader quickly to find what he wants.

The volume is accompanied by an abridged index to Volumes I to V of the new edition, which is a list of cross-references such as would have appeared alphabetically as titles had the dictionary been published as a complete work.

Notes on Books

The seventh edition of the *Synopsis of Hygiene,* familiarly known as "Jameson and Parkinson," succeeds the sixth after three years. In the interval Sir WILSON JAMESON has been translated to the Ministry of Health, so that Colonel G. S. PARKINSON now assumes the title of sole author. Though the book appears in a time of warfare it does not enter into detail regarding emergency war measures affecting the health of the people. Rather it seeks, as hitherto, to portray well-established public health practice only, but at the same time, within this limitation, to be thoroughly up to date. Much of the new material added with this latter object figures in the sections on infectious disease and food. Under infectious disease there are references to the spread of streptococcal infections, diphtheria bacilli and floor dust, the control of cerebrospinal fever, the Vi antigen in typhoid fever, the Millbank portable hot-air disinfector, zoster and varicella, rabies, and trichiniasis, together

with the Measles and Whooping-cough Regulations of 1940. Among the food references are such topics as the trends of nutrition, the nature of the vitamins, the pasteurization of milk, and the calorific value of the soya bean. The Pharmacy and Medicines Act of 1941 also finds a place. In order that the special health aspects of the war may not be entirely omitted the work concludes with a brief but useful summary statement on the Emergency Hospital and Laboratory Services, the Tuberculosis Regulations of 1940, the Scabies Order of 1941, and other war-time measures. The seventh edition of the *Synopsis* is, like its predecessors, a reliable and fully informative guide. The publishers are J. and A. Churchill; the price is 25s.

Mr. MICHAEL BULMAN, writing his new book on *Midwifery and Obstetric Nursing* (Faber and Faber, 12s. 6d.), starts clear of previous commitments and is able to work methodically through his subject, from menstruation to lactation via pelvic anatomy and the mechanics of parturition, in 352 carefully written pages. Final chapters on malignant and venereal disease are wisely added, for the midwife is an influential propagandist. That she should be an intelligent and sympathetic friend to her patients is also well conveyed. Though the preface does not state whether the C.M.B. syllabus is covered, this appears to be the case except with regard to the legal position of the midwife. It is not quite clear how much previous knowledge of nursing is presumed, but, taken with practical work, the teaching is probably detailed enough. This is true of the straightforward diagrams. More exact instruction in how to make a vaginal examination, and the measurement of the nurse's hand, might be useful. The danger of soiling from the anus (which is uncovered by towels in Figs. 50 to 53) might be more emphasized, and the section about sedatives and analgesics might be more lucid. Delay of the shoulders in a vertex presentation has been omitted. A student would be grateful for a fuller index and less brittle paper. As to the latter, we know the difficulties of to-day, and can congratulate both author and publishers on the issue of such a well-constructed and well-produced book under war conditions. It should be widely useful.

Messrs H. F. W. Deane and Sons, 31, Museum Street, W.C.1, have issued the thirty-sixth edition, for 1941-2, of the *Girls' School Year Book* at 7s. 6d. This is the official book of reference of the Association of Head Mistresses and, besides the usual authoritative information, gives as far as possible the details of the many moves of girls' "public" schools which the war has imposed upon their governing bodies.

Preparations and Appliances

A MIXING DEVICE FOR GASES

Dr. J. PLESCH (London, W.1) writes:

The equipment for oxygen therapy recommended by Drs. S. L. Cowan and J. V. Mitchell (January 24, p. 118) represents a real improvement. An apparatus for mixing gases in variable and accurately known proportions has become a real necessity, and its applications are manifold. For this reason I think I am justified in describing here a modified mixing device which can be applied to oxygen therapy as well as to anaesthetics.

The problem is to mix two gases and administer them to the patient in such a way that their proportions remain constant in spite of any variations in the respiration of the patient. What these gases are—oxygen and air, nitrous oxide and air, or nitrous oxide and oxygen, or any other mixtures—is, of course, quite immaterial to the principle of the device. For the sake of simplicity we will confine our attention to mixtures of air and oxygen in the following description.

The principle of the modified gas mixer is best explained by reference to Fig. 1. This shows the mixing device in section. Air enters Tube A from a gasbag, passes down the cylindrical annular space B between the tube C and the fitting D, and flows into tube E, which leads to the mouthpiece. The same reduction in pressure in the mouthpiece which causes the air to flow in will also draw in the contents of the conical annular space F between D and the conical piece G. Thus oxygen is drawn from the reservoir through tube H into F, and is mixed with the air in the space I and during the passage of the two gases through the annular space J. Now the rate of flow of the two gases will depend on the pressure gradient and essentially on the area of cross-section of the respective flow

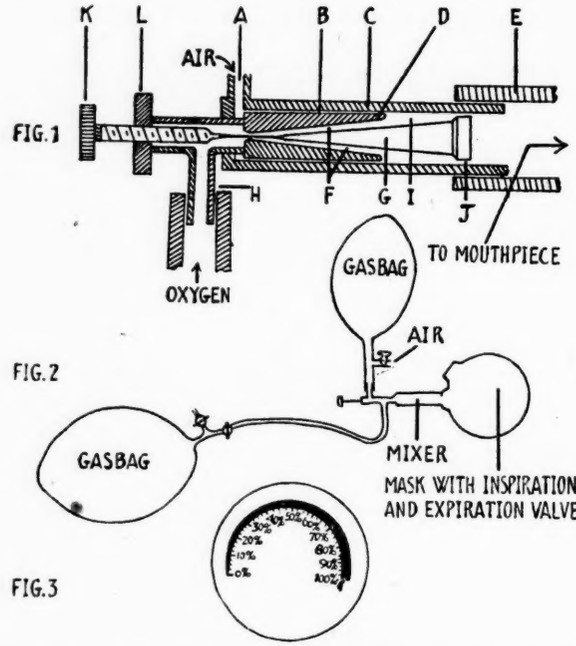

FIG. 1

FIG. 2

FIG. 3

spaces B and F. If the air and oxygen reservoirs are gasbags, such that the gases are under atmospheric pressure, then the pressure gradient is the same for both. The relative proportions of oxygen and air can be varied by altering the rate of flow of the oxygen. This is done by moving the cone G axially by means of the graduated screw-adjuster K, which can be fixed in any desired position by the lock-nut L.

The dimensions of the two flow spaces must, of course, be adjusted in such a way that the flow in both of them is streamline and does not become turbulent even at high rates of respiration and when the space F is at its widest, otherwise the proportionality of the rate of flow of the two gases will break down. The adjuster screw K may be calibrated in such a way that for any position the proportion of the two gases can be read off directly. Fig. 2 shows diagrammatically the arrangement of the device with the mask and gasbags.

If Drs. Cowan and Mitchell decide to retain their mixer, then I think it would make their apparatus more handy if, instead of separate holes in their disk, which permit a step-by-step variation of the proportions of the two gases, they would use the device sketched in Fig. 3. Here the separate holes are replaced by a slit of increasing width, which slides over the main aperture in the same way as before. The new arrangement, however, permits a gradual variation of the gas mixture, which has obvious advantages.

Concerning the rebreathing of carbon dioxide, it is no doubt often desirable to restrict this. On the other hand, it may happen that by hyperventilation breathing becomes superficial and the apnoeic state may even be reached. In this case it would be desirable to have a means of increasing the partial pressure of carbon dioxide so as to stimulate the respiratory centre. A simple way of doing this would be to have between the face and the expiration valve a dead space whose volume could be varied within wide limits by a telescopic tube or concertina. In order to make sure that the gas in the dead space is not by-passed, but is actually rebreathed, an arrangement may prove useful. Here the inspiration and expiration valves are in the two branches of the Y-piece, the stem of which is attached to the telescopic dead-space (concertina) tube, the other end of which is attached to the face-piece. This type of device makes any artificial addition of carbon dioxide superfluous, and thus prevents any further complication of the apparatus.

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TUBERCULOSIS AND THE WAR

There is unfortunately no doubt at all that this war, as the war of 1914-18, is witnessing a rise in the mortality from tuberculosis. Taking the year ending mid-1939 as the standard, the increase in deaths from respiratory tuberculosis amounted to 6% in the first year of war and 10% in the second year.[1] For the years ending mid-1939, mid-1940, and mid-1941 deaths from respiratory tuberculosis in males were respectively 12,724, 13,560, and 14,068 ; for females the corresponding figures were 8,983, 9,477, and 9,774. In the same three periods deaths of males from other forms of tuberculosis were 2,244, 2,279, and 2,579 ; for females the corresponding figures were 1,921, 1,986, and 2,321. Dr. Stocks[1] points out that the bulk of the recent increase in mortality from "other forms" has been due to tuberculous meningitis: in the first half of 1940 deaths from this cause numbered 1,047, but in the first half of 1941 the number was 1,422. For children under 10 deaths from tuberculosis numbered 1,001 during the whole of 1939, but amounted to 1,233 in the first three quarters of 1941.

That more than one factor enters into the increased mortality from tuberculosis in wartime is clear, and in a recent article in this *Journal* Laidlaw and Macfarlane[2] were inclined to minimize the effect of malnutrition, and to stress the influence of long hours of work, overtime, strain, and ill-spent leisure. It is to be hoped that the Medical Research Council committee recently appointed by the Ministry of Health to investigate the increased incidence of tuberculosis will throw a light on this perplexing question. In the meanwhile we may note with approval a memorandum just issued by the National Association for the Prevention of Tuberculosis and printed elsewhere in this issue. It repeats in clear and energetic fashion the plea often made for detection of tuberculosis at an early stage, or at all events the early detection of tuberculosis. It is common knowledge that in tuberculosis symptoms often do not appear until the disease is well developed, and in some people not until it is too advanced for treatment. Or perhaps it would be more accurate to state that symptoms, while present, are not severe enough to alarm the patient or to suggest to him the need for medical advice. Or again, the patient may be doing his utmost to conceal his apprehension, and does this by persuading himself that he is feeling perfectly well. The net result is the same—many undiagnosed tuberculous patients are at large in the community at considerable risk to themselves and to others. It is a truism to say that what is required is to diagnose the disease in these patients at the earliest possible moment, and that the real desideratum is the detection of early tuberculosis. There can be no question that to this end the most important aid is radiography, and considering that Roentgen made his discovery in 1895 we may agree that the interval between the discovery and its full application has now reached conventional length. The memorandum by the N.A.P.T. advocates extensive *x*-ray examination of those in the 'teens and early 20's and of those who are apparently healthy ; and it endorses the resolution passed by the Trades Union Congress in September of last year that "in addition to the examinations prescribed under Section 99 of the Factories Act, 1937, there should be a further thorough examination, including an *x*-ray lung examination, not later than twelve months after entering the employment in factories or workshops and every succeeding twelve months up to the age of 18 years." The N.A.P.T. suggests that every young person should have an *x*-ray examination of the chest on leaving school and at intervals during early adult life, and points out that boys and girls in secondary schools, technical schools, colleges, and universities are at a time of life when physical and mental strain is great and the risk of tuberculosis serious.

The rise in tuberculosis is a special wartime problem, and should be tackled with the sense of urgency that is being given to other wartime problems. It is not, or should not be, something which we can plan to cope with when the war is over. One obvious obstacle would be the insufficiency of *x*-ray equipment, but we are glad to be assured by the memorandum that "there is reason to believe that the *x*-ray manufacturers will shortly be able to provide apparatus as soon as they receive orders." It is to be hoped that the Ministry of Health will see that these orders are given. We understand that this refers to machines for miniature radiography, the use of which in the examination of large numbers of people in a short time has now established itself as a highly important public health procedure. Gilchrist, Graham, and Davies record elsewhere in this issue that a careful comparison of 239 full-size and miniature films showed that the latter did not miss anything of importance. There would inevitably be some lag between the ordering of suitable machines in this country and the delivery of them by the manufacturers. In the meanwhile a useful start could be made if machines were to be obtained from the U.S.A.

The memorandum of the N.A.P.T. seems to suggest that it would be content with nothing less than a radiographical survey of the greater part of the population. Some time after the war this may indeed be achieved. Until then we must be content with a more modest programme. One obvious limiting factor is the number of available skilled radiologists. Another and most formidable obstacle is the reluctance of people to be examined. Into such reluctance many factors enter, and among these perhaps the most tangible is the economic. The wage-earner threatened with tuberculosis is naturally alarmed at the economic consequences to his wife and family ; and the financial support of them during his time in sanatorium, and of himself, as well, in the interval between leaving sanatorium and entering work, are matters intimately bound up with the care and restitution to health of the tuberculous patient. The N.A.P.T. does not favour any compulsory measure, and indeed it would be difficult to introduce into this country legis-

1 Stocks, Percy, *Lancet*, 1942, **1**, 189.
2 *British Medical Journal*, 1941, **2**, 436.

lation enforcing the examination of supposedly healthy people. Much, of course, can be done in various forms of employment by making a thorough medical examination, including radiography, a condition of entry into such employment, just as, shall we say, the ability to read and write is made a condition. For the rest, propaganda through the usual media, and especially through the individual medical practitioner, must be brought into full operation. In the meanwhile, and for many reasons, it would seem that a start could most suitably be made by instituting routine radiography of children leaving school.

HOURS OF WORK AND LOST TIME

The importance of the increased production of war material is stressed at frequent intervals by those in authority from the Prime Minister downwards, and it is universally admitted that we are not getting as much output from our factories as we could do and ought to do. In several of its recent reports the subcommittee of the Select Committee on National Expenditure has discussed the problem and has made various recommendations. It points out that "there are many problems affecting the best use of labour which cannot be solved without scientific study," and that "the Industrial Health Research Board exists for precisely this purpose." It recommends that the Board "should work in the closest co-operation with the Production Departments," and that one of the most important of its problems is "to determine the best length of working week for a wide range of different kinds of work and for men, women, and juveniles." In Emergency Report No. 2[1] the Health Board has now published the first results of its labours. Unfortunately the investigators were delayed by difficulties in obtaining access to suitable factories, but in the last few months they have been provided with additional facilities, and the investigation now covers fifty factories, representing approximately 200,000 workers. The investigators complain that throughout the inquiry they were severely handicapped by the lack or unsuitability of records, and they were also handicapped in many instances by the disturbing effects of air raids, black-out conditions, and small changes in the machinery and in the form of the objects produced. Nevertheless they are to be congratulated on having obtained a large amount of valuable information which, if properly digested and acted upon by works managers, should substantially improve production.

Perhaps the most striking of the results obtained relate to the effects of the tremendous production drive which began immediately after the retreat of our troops from Dunkirk in May, 1940. For instance, a group of 115 women, engaged on work which was mostly mechanized, had their hours of work raised from 56 a week to 69 a week, and in consequence of these extra hours, and of the stimulus of patriotism, their average output increased 26% in the first week. In the second week the increase was only 15%, and in the next six weeks about 10%. After that the output fell well below that preceding the drive, partly because of air-raid warnings, but chiefly because of the fatigue caused by the excessive hours of work. The hours were then reduced for a time to 52 a week, and were subsequently raised to 63 a week, the output then being just about that experienced during the original 56-hour week. As a matter of fact the hours of actual work put in by the women were nearly the same as before, in spite of their being nominally 7 hours greater, owing to absenteeism mounting up to about 9 hours a week in place of the previous 2½ hours.

In a group of 200 men, employed largely on non-mechanized work, the hours of work during the drive were at first raised from 62 a week to 73½ a week. Output increased 37% in the first week, but then it rapidly dwindled, though never to a lower figure than that preceding the drive. In another group of 200 men the hours of work were scarcely changed at the time of the drive, but output showed a small improvement. However, it showed a bigger one some months later, when the hours of work were cut down from 66 to 60½ a week. This reduction of hours was effected by giving the men alternate weeks off, and it is a pity that the experiment was not pressed to its logical conclusion by giving them a rest during every week-end. In some groups of workers the effects of reduced hours of work were reinforced by allowing holidays (lasting three to seven days) in August and September, and it was observed that in almost every case the holidays were followed by a rise in the rate of working. Absenteeism diminished, and the effects of hours of work on absenteeism from sickness, injuries, and voluntary absence were ascertained at a large number of factories. Some of the most striking results were obtained at a factory where about 2,000 women were working about 64 hours a week when the production drive began. The number of sick workers rapidly grew, those suffering from nervous breakdowns and nervous debility increasing, in the course of three months, from 11 per 1,000 workers per week to 24 per 1,000. Directly the hours of work were cut down to 57 a week the number of cases fell to about 12 per 1,000, and they kept at this figure during the winter, though absenteeism from respiratory diseases naturally increased. Most of the workers, and especially the women, were apt to take single days off from work at irregular intervals, and the amount of time lost through this casual absence was greater and greater the longer the hours of work. Also it tended to become excessive in certain of the newer and rapidly expanding firms. The ill effects of Sunday labour were especially in evidence at two modern factories where the three-shift system was worked on two Sundays out of every three. The number of women who took an unauthorized day off from work on these Sundays averaged 20%, in spite of the fact that double pay was forfeited, while from Monday to Friday the absenteeism was only about half as great. On Saturdays, however, it was no less than 37% at one of the factories. The report states that the chief reasons for the high rate of casual absenteeism were (*a*) the long distances and the time taken in travelling between home and factory, (*b*) the employment of many workers, especially women, who had little or no previous experience of factory con-

[1] Emergency Report No. 2 of Industrial Health Research Board on "Hours of Work, Lost Time, and Labour Wastage." H.M. Stationery Office, 1942. (Price 6d.)

ditions, (*c*) the seven-day week, and (*d*) the unsatisfactory conditions of work, such as poor ventilation. After the observations had been recorded the Saturday afternoon and Sunday morning shifts were abolished, but the effects of this change on absenteeism are yet to be determined. The dependence of absenteeism on many of the women being newcomers to industry who found it hard to settle down to factory life is revealed in the data relating to labour wastage. It was found that in a period of a year no less than 65% of the women dropped out altogether, compared with 27% of the men. The wastage was reduced to about a half when the Essential Works Order was introduced in April, 1941, under which no person could leave his or her employment without permission of the National Service Officer. However, some of the workers managed to evade the Order by obtaining medical certificates of unfitness.

Upon the problem of ascertaining the relation between hours of work and output, the investigators considered that their results were influenced by so many factors as to render them useless for the purpose. The results obtained by the Health of Munition Workers Committee in 1916-17 showed that when the hours of work were changed from one length to another it took two to four months before the workers became fully adapted to the altered hours, and this meant that data ought to be gathered for a steady period of about six months after the change of hours. During this period there must be no alteration in the conditions of work such as the quality of the articles produced and the efficiency of the machinery. However, in the present report the investigators feel justified in claiming that "there is little to gain, and probably more to lose, when the weekly hours of work exceed 60 to 65 for men and 55 to 60 for women"; but this conclusion differs distinctly from the recommendation made by the above-mentioned subcommittee when it stated that "the investigations carried out by the Board indicate that, over an extended period, weekly hours of work should not exceed 60 for men and 55 for women." The difference between 55 and 60 hours for a woman may, indeed, be critical. She may just be able to manage the former hours, whereas the latter may result in cumulative fatigue, sickness, and much absenteeism. It is to be hoped that in their next report the investigators will be able to adduce output data showing the effect of cutting down the hours of work to less than 55 a week.

THE HISTORY OF CINCHONA

Even those who have only a smattering of medical history can hardly fail to have heard of the remarkable way in which the chemotherapeutic action of cinchona bark was allegedly first discovered. The story was popularized even if it was not originated by one Sebastiano Bado[1] in 1663. The wife of the Count of Chinchon, Viceroy of Peru, was stricken, so the story goes, with a tertian fever in the city of Lima. No cure was forthcoming until the Spanish governor of the neighbouring town of Loxa, hearing of the condition of the Countess, produced a powder made from bark which, to the amazement of all, caused her immediate recovery. The citizens of Lima thereupon begged that this powder might be distributed to them as they also were subject to agues. The Countess, who was a benevolent woman, ordered large quantities of the bark and distributed it to the sick with her own hands. So for a long time the drug was known as the "Countess's powder." Sir Clements Markham[2] added some further picturesque details to this account. He identified the heroine of the story with Ana de Osorio, Countess of Chinchon, and at the same time dated the miraculous cure to 1638. On her return to Spain the Countess is said to have entrusted large quantities of the bark to her physician, Dr. Juan de Vega, who cured many persons on the Chinchon estates in Southern Spain. But this picturesque story has unfortunately been undermined by the researches of Haggis.[3] In the first place he has found that Ana de Osorio, the first wife of the Count of Chinchon, died in 1625, three years before her husband was appointed Viceroy of Peru: the lady who did go to South America as second wife of the Count was Doña Francisca Henriquez de Ribera. It so happens that a few years ago Miss I. A. Wright, searching in the *Archivio Generale de Indias* at Seville on behalf of the late Sir Henry Wellcome, came across the official diary of the Count of Chinchon[4] during his term of office as Viceroy of Peru. This diary, which was previously unknown, was kept by the Count's secretary, Dr. Don Antonio Suardo, with most scrupulous care; it gives an almost day-to-day account of the whole Chinchon family. The Countess seems to have been a remarkably healthy woman, for during the eleven years that she remained in Peru she was ill on only two occasions—once in 1630 with a sore throat, and again in 1636, when for one day both she and the Viceroy suffered from "flux and cough on the lungs." The medical history of the Count, however, is a very different affair, for he was constantly in bed with recurrent attacks of fever. But there is no mention of any miraculous cure; although almost every physician in Lima was at one time or another called in consultation, the only treatment suggested was repeated bleeding together with prayers in all the monasteries and convents in the city. Finally, there is conclusive evidence that neither the Countess of Chinchon nor her physician, Juan de Vega, ever returned to Spain. When the Count was at last relieved by the Marquis of Mancera the Chinchons set out for Spain, but on reaching Cartagena, Colombia, the Countess was struck down by an epidemic disease then prevalent and died, after an illness of a few days, on February 28, 1641, from what may well have been yellow fever. Dr. de Vega, on the other hand, remained in Peru in occupation of his chair as Professor of Medicine in the University of Lima, and as a very old man was still signing documents there in 1650.

Having spoilt a perfectly good story Haggis goes on to give what would appear to be the more correct history of the "discovery" of cinchona. At the end of the sixteenth and beginning of the seventeenth centuries there was a considerable export of medicinal substances from the New World to Spain and Italy. Among the products exported was the bark of a tree which from the accurate descriptions given was that of *Myroxylon peruiferum*: from this bark was obtained Peruvian balsam, which early in the seventeenth century was used in Rome as a febrifuge. Incidentally the tree which yields Peruvian balsam was called by the Quichuan Indians of Peru "quinua-quinua," a term which unquestionably refers to a leguminous tree possessing medicinal virtues. There is considerable evidence that the term "quina-quina" is synonymous with quinua-quinua and derived from it. Unfortunately for the exporters of medi-

1 Bado, Sebastiano. *Anastasis Corticis Peruviae seu Chinae Chinae definsio S.B.*, 1663, Genoa.

2 Markham, Sir Clements R. *A Memoir of the Lady Ana de Osorio, Countess of Cinchon*. 1874, London.

3 *Bull. Hist. Med.*, 1941, **10**, 417.

4 *Archivio Generale de Indias*, Seville. 70-2-6 Lima 45 (photostat copy in possession of the Wellcome Historical Medical Museum, London).

cinal substances from South America to Europe the supply of the bark from *Myroxylon peruiferum* was not sufficient to meet the demand. In these circumstances the exporters resorted to the adulteration of Peruvian bark by another not unlike it. This bark, which gradually replaced the other, was undoubtedly derived from cinchona trees, although naturally it was referred to by the export trade under the old-established name of "quina-quina." From this fact arose the hopeless confusion during the seventeenth century over the value of cinchona bark as a remedy for malaria. Some observers were dealing with Peruvian bark derived from *Myroxylon peruiferum*; others, with bark obtained from what Antonio de la Calancha,[5] writing before 1633, and Bernabe Cobo[6] before 1659 describe as "el Arbol de Calenturas," the fever tree: from their descriptions the fever tree was most certainly cinchona.

It is a curious reflection that we thus owe one of our most successful chemotherapeutic remedies not to man's scientific acumen and research but to his dishonesty and greed.

NEW ANAESTHETICS

In the Department of Pharmacology in Toronto Prof. V. E. Henderson and his colleagues are steadily investigating new volatile anaesthetics. In the Department of Pharmacology at Baltimore Dr. J. C. Krantz and his colleagues are doing the same thing. The most useful observations from Toronto are those on ethyl-normal-propyl-ether by Brown and Lucas,[7] who have been seeking a mixture which does not explode. Ethyl-normal-propyl-ether is 1.5 to 2 times as potent as ethyl ether, and concentrations of 4 to 5% of the former depress the respiration as much as concentrations of 6 to 8% of the latter. Concentrations of ethyl-normal-propyl-ether of 2.5 to 3%, mixed with nitrous oxide and 20% of oxygen, produced light surgical anaesthesia which was found sufficient for operations such as dilatation and curettage, amputation of the hand, suprapubic prostatectomy, hydrocele operation, and others. This gas mixture is not explosive, and in more than 80% of patients gave rise to no vomiting whatever. Other substances examined at Toronto have proved unsatisfactory, but have effects of interest. Thus allene, which has the structure $CH_2=C=CH_2$, was found by Ferguson[8] to result in lung oedema. Then methylacetylene, investigated by Henderson,[9] is much more potent than acetylene, a mixture containing 10 to 15% being similar in anaesthetic effect to one containing 40% acetylene. Unfortunately, however, methylacetylene produces an unusual type of anaesthesia in which convulsive movements, both tonic and clonic, are seen.

In Baltimore, Krantz and his colleagues[10] have studied cyclopropylethyl ether, which is sufficiently promising to justify a special name, "cypreth ether." The substance is chemically a half-way house between cyclopropane and ordinary ether, one hydrogen of cyclopropane being replaced by $-OC_2H_5$. Its potency approaches that of chloroform, while its safety margin is much greater than that of chloroform, ether, or divinyl ether. This margin was measured by finding the ratio of the amount needed to cause respiratory arrest to the amount needed for surgical anaesthesia. Cypreth ether causes no functional or histological damage to the liver in dogs or monkeys, and no cardiac arrhythmia. As yet it has not been tested extensively in man, but the results so far obtained are very promising.

The work described above prompts the reflection that in this country no work whatever has been done towards the introduction of new anaesthetics, either volatile or any other. The total failure to compete in this field is the penalty we pay for having so few chairs of pharmacology in our universities, and for having had till now no commercial pharmacological laboratories of large size.

5 Calancha, Antonio de la. 1639. *Cronica moralizada del orden de San Augustin en el Perú.* Barcelona.
6 Cobo, Bernabe. *Historia del Nuevo Mundo.* (Completed July 7, 1653.) MSS.
7 *Canad. med. Ass. J.*, 1940, **43**, 526.
8 *J. Pharmacol. exp. Therap.*, 1939, **66**, 449.
9 Ibid., 1940, **69**, 74.
10 Ibid., 1941, **72**, 233.

JUVENILE CRIME DURING THE WAR

The war has a double effect upon crime: it increases the amount committed, and decreases the possibility of counteracting it. A recent circular of the Home Office and the Board of Education went thoroughly into the causes of and possible remedies for the wartime increase in misdoing by young people. Miss Eileen Younghusband gives us, in the *Howard Journal* for last autumn,[1] an intimate close-up of the problems with which the circular dealt more or less academically. Not the least of the difficulties, she says, is the ceaseless change that takes place in the picture; the one constant thing is the steady growth in the number of cases before the juvenile court. Her impression is that the phase in which good little boys came before the court from good homes because they had no school to go to is over. The courts are getting the usual exceedingly high proportion of children from broken and unhappy homes, and the number of these is being increased by war conditions. Also, the number of young offenders under school age is rapidly rising. Little gangs of boys between 10 and 14 are beginning to reappear on the old charges of stealing bicycles and breaking open gas-meters, and the probation officers believe that the number of evacuated children returning to town is increasing. The wartime conditions directly affecting delinquency are, she thinks, shelter life, the black-out, the breaking up of the family, high wages, the closing of clubs, and the ease of looting. It is not so much that the shelter affords a new cause of delinquency as a better chance of it than the cheap café, the cheap dance-hall, or the streets. Where evacuation has in her opinion done most harm is in taking away the mother and the smaller children and leaving the father to spend his time in the "pub" and the older boys and girls to fend for themselves. The closing of clubs is a very serious factor, because it means that instructive and constructive use of leisure has gone at the same time as many other uses of leisure have gone. The difficult factor about looting is that no moral stigma seems to be attached to it in the neighbourhood with which Miss Younghusband is dealing. The most common difficulty confronting the juvenile court is that the remand homes are overfull of the wrong people: they are therefore forced into the undesirable expedient of sending boys on remand to Feltham Boys' Prison. She advocates the provision of more hostels for difficult children in the reception areas. Judge Gamon, in the same number, proposes that childish delinquency should be taken entirely out of the criminal law and made subject to a separate non-criminal code of delinquency; and that the juvenile court should be empowered to re-enforce probation by prescribing correctional treatment to be administered by the local education authority. Penal reformers are passing through dark and difficult times, but the *Howard Journal* gives an encouraging picture of their undaunted energy in maintaining their position and improving it by whatever means they may.

1 Vol. VI, No. I. The Howard League for Penal Reform, 35, Beaumont Street, Oxford. 1s. 3d. post free.

MEDICAL CARE OF TROOPS ON ACTIVE SERVICE IN ENGLAND

BY

D. G. ROBINSON
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No original thought or criticism is expressed in these notes. They consist of some general impressions gained while acting since the outbreak of war as area medical officer among troops in one particular district, and it is thought that they may be worth recording. The few simple treatments described are those which may reasonably be carried out with the necessarily restricted armamentarium of a regimental medical post, the essential object of such treatments, from the administrative point of view, being to keep men at duty with their unit.

Myositis, Fibrositis, etc.

Experience has prompted me enthusiastically to endorse the claims of Mr. Martin Button (1940) for the local injection treatment of the conditions known as "muscular rheumatism." A 2% solution of novocain is used in selected cases. The guiding sign is the presence of one or more deep pressure points of maximum tenderness, failing which a particular area of intense pain evoked by active movements of the muscle or muscles. Usually 1 or 2 c.cm. of the solution is injected just underneath the fascia immediately covering the points of tenderness, after which the patient rests on the bed for two or three hours. He is then returned to his unit with a recommendation for light duty, until his reappearance on sick parade the following morning, when he is most often fit for "medicine and duty." When necessary the treatment is repeated at intervals of two days. It has been applied to most varieties of traumatic and idiopathic conditions of this group, and particularly gratifying results have been obtained in those cases of pleurodynia unassociated with pulmonary signs. The following is a table of treatments covering a period of six months.

Type of Case	Number of Cases	Number of Injections at One Time in Each Case	Number of Times Treatment was Repeated for Each Case	Days between Start of Treatment and Return to Full Duty
Lumbago	13	2	nil	2
Lumbago	1	1	nil	2
Lumbago	1	2	3	8
Sprained abdominal muscles	2	3	nil	2
Sprained abdominal muscles	1	2	1	5
Sprained thigh muscles	3	2	nil	2
Sprained thigh muscles	1	3	1	5
Tenosynovitis of extensors of hand ..	3	3	2	10
Pleurodynia.. ..	11	1	nil	2

Skin Diseases

Scabies.—I have little doubt in my own mind that, in view of the frequent bathing and scrupulous hygiene which are now the lot of the soldier in this country, the vast majority of Army "scabietics" are infected by their own families while at home during their periods of leave. Treatment of the cases in the area is carried out in one of the R.M.P.s in my charge, good results being obtained with thiosulphate and HCl treatment or by the sulphur method. The number of relapses is not unduly large.

Pediculi.—Head lice are uncommon and body lice are rare. Most cases of pediculosis pubis are in men recently returned from leave or in men who admit to irregular coitus of recent date. Treatment of the pubic louse is simple and effective. The man works and eats with his comrades, but sleeps alone and digs a trench latrine for his exclusive use. During the earlier months of hostilities an 80% solution of spirit. vini meth. in water was found effective after the parts had been shaved. In order to economize in spirit industrial paraffin is now used for the same purpose, and has not been found to cause undue excoriation.

Impetigo.—This is fast becoming less prevalent, doubtless due in large part to the opening in the Command of an institution to which the patient may be sent for detention.

Seborrhoea.—I have been impressed with the large number of troops suffering from seborrhoeic dermatitis. Most cases are mild. The eruption is usually of the pityriasiform type, with crural or axillary distribution—in about 30% of the cases both. Bacteriological investigation has revealed *Staphylococcus albus*. In nearly every case lack of personal cleanliness can be ruled out as a predisposing factor. It is as common among those who habitually wear underclothes as among those who do not, and no increase in its incidence has been noticed since the introduction of "anti-gas" kit. The scalp is not often affected concurrently. Eczematization is rare. Treatment is the application of sulphur praecip. 10 grains, pasta zinci co. *B.P.C.* ad 1 oz.

Epidemic Enteritis

An outbreak of diarrhoea, first affecting forty men at one camp site, occurred in May of last year, all of the men being awakened in the early hours of the morning by colicky pains which were followed by severe diarrhoea. Some complained of nausea and two only of retching. All those affected were back to normal duties in forty-eight hours. The motions were of the small-intestine type and chocolate-coloured. No pyrexia was noted in any of the cases. Eight days later a second crop of cases occurred, fewer in number, of similar type and severity, and affecting, in some instances, those men who complained of symptoms in the first outbreak. After a further interval of ten days there were a few more identical cases, but all the victims were back to duty within a day or two of the onset of symptoms.

The outbreak resembled that described in detail by Smith and Davies (1941), in that every conceivable article of drink and food, including a sample of the contents of the stockpot, was repeatedly examined, always with negative results, for organisms of the enteric, dysenteric, streptococcal, and staphylococcal groups. General hygienic conditions of the site were satisfactory. Beasts were grazing in the fields immediately surrounding the camp, but inquiries from the agricultural authorities revealed no outbreak of disease or abortion among the animals. No blood specimens were tested for the Widal reaction, but many specimens of faeces were examined at various times during the outbreak, all with negative results. The personnel at other camps in the area were not affected except at one site which was occupied by the same unit, who were consuming rations from the same sources. Here seven men had diarrhoea at about the same time as the third batch of cases occurred at the original camp. All the patients complained of similar symptoms, the progress of the complaint was identical, and the results of the bacteriological examination of the faeces were also negative. No further cases occurred here. In neither camp was an officer affected, although the officers consume the same rations as other ranks.

Cerebral Influenza

Pattison (1940) records twenty cases, occurring epidemically, of cerebral influenza simulating early cerebrospinal meningitis, and two cases similar to those described have occurred in this area. Unlike Pattison's cases, however, each was sporadic in nature, one occurring in October, 1939, and the other towards the end of 1941.

Case 1.—Sudden onset of severe headache with a temperature of 102° F. in the first twenty-four hours, accompanied by neck rigidity and photophobia, with negative Kernig's sign. Cerebrospinal meningitis was feared, and arrangements were made on the second day of the disease for the man to be admitted to hospital. There his temperature had dropped to normal on the fourth day.

Case 2.—Similar onset of severe frontal headache with high temperature within twenty-four hours and double Kernig's sign. No faucial symptoms were complained of, and the case was notified as cerebrospinal meningitis; sulphapyridine was given and the patient was removed to hospital. The course of the disease there was similar to that in Case 1, the man being discharged after ten days.

General Remarks

On first enlistment recruits are lectured in batches on camp and personal hygiene, and an explanation is given of the need for the subsequent vaccination and inoculations which they are to undergo. The dissenter is a rarity, and I have found that the best way of overcoming his objection is to choose one or two intelligent types of the man's "co-intakes" possessing some obvious personality, and ask them to point out to the objector his duty not only to himself but to his new-found colleagues. The delinquent apparently considers his comrades less biased than the medical officer, and only four men in a large number of recruits have finally refused.

Increase in body weight during the first few weeks of Army life is too well known to merit much comment. In a series of 540 conscripted recruits aged between 20 and 36 the average net gain in weight during the first three months of training was 24 lb. Thirteen men lost weight during this period, six of whom were shown to be suffering from active disease, and three were obese on first joining. Further recording of their weights over a longer period was impracticable owing to their distribution to duty after preliminary training.

Summary

Clinical and general impressions formed during two years' war service in a particular military area are described.

Simple methods of treatment are particularly adapted to the purpose, where possible, of retaining the soldier on some kind of duty, thereby avoiding his becoming a casualty to his unit.

Thanks are expressed to Colonel E. N. P. Martland for permission to publish these notes.

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SYMPTOMLESS EARLY TUBERCULOSIS

RADIOGRAPHIC METHODS FOR DISCOVERY

The memorandum printed below sets out the policy of the National Association for the Prevention of Tuberculosis in regard to the more widespread use of radiographic methods in the discovery of pulmonary tuberculosis, particularly of the symptomless cases in apparently healthy young people. It explains the objects the Council of the N.A.P.T. has in view, and the methods suggested for attaining them.

Memorandum by N.A.P.T.

1. Tuberculosis of the lungs begins without any warning to the patient. By the time patients voluntarily come for treatment the disease is in an advanced stage, and such patients have perhaps already infected numerous other people. There are about a quarter of a million actual cases of pulmonary tuberculosis in the British Isles, and of these about 1,500 between the ages of 15 and 50 die each month. In spite of this the total number is kept up by a steady flow of recruits. To prevent the disease in the future we must try more persistently to discover patients in the early stages, before they have become infectious, since this endeavour will ultimately mean the conquest of tuberculosis. Under wartime conditions the disease shows a tendency to increase, as it did in the last war.

2. The only method of detecting tuberculosis before it produces symptoms is by *x*-ray examination of the chest. This is a simple, painless, and rapid procedure. By modern methods it can be carried out for large numbers of people at one time. We need more *x*-ray examinations, particularly of those in the 'teens and the early twenties, and we need more *x*-ray examinations of those apparently healthy.

3. The National Association believes that when these facts are known public opinion will insist that this modern method of discovering early disease shall take the place of older, less effective methods. People will face the risk of tuberculosis with greater confidence when they know that the latest knowledge is being fully used to benefit the individual and the community. The worker stricken by tuberculosis is under a heavy handicap, and his family suffers in proportion to the length of his absence from work, or his compulsory acceptance of lower-paid employment. Anything that can minimize industrial hardships and domestic tragedies of this disease will be welcomed by the workers. The National Association welcomes heartily a resolution in favour of *x*-ray examinations for young workers passed by the Trades Union Congress (September, 1941), and now under consideration by the Council:

> "That this Congress urges the Government to take all necessary steps to ensure that local authorities fully comply with the regulations affecting the medical examination of school children, and that the examination prior to leaving school shall be of such a thorough character that incipient or hereditary disease or weaknesses may be detected. Congress also urges that in addition to the examinations prescribed under Section 99 of the Factories Act, 1937, there should be a further thorough examination, including an *x*-ray lung examination, not later than twelve months after entering the employment in factories or workshops and every succeeding twelve months up to the age of 18 years."

4. The ideal would be for every young person to be examined by *x* rays on leaving school, and at intervals during early adult life. Those who enter the Forces can most easily be included in such a scheme, but all—both men and women—ought to be re-examined from time to time. The entry into the services of Government and local authorities would be a good opportunity to augment regular medical examination by *x* rays, as a safeguard to the individual and also to fellow workers. The early discovery of active disease may not only mean recovery for the patient in a shorter space of time, but safety for others in contact.

5. Boys and girls in secondary schools, technical schools, colleges, and universities are at a period of life where physical and mental strain is great and the risk of tuberculosis serious. The disease at these age periods shows a tendency to increase. Regular *x*-ray examinations are advisable, and the Association appeals to doctors responsible for the health of such institutions to encourage their wider use. This aspect of the problem is dealt with in the first comprehensive resolution of the Trades Union Congress quoted above.

6. Under the Factory Acts the examining surgeon examines young people who enter into industry under the age of 16. We believe the authorities should take into consideration the expediency of including *x*-ray examinations at this stage, as is recommended by the second Trades Union Congress resolution.

7. Finally, there are the commercial firms with large staffs in their offices and factories. The majority of such employment is not pensionable, and the workers do not come under any regular scheme of medical examination, except national health insurance. Some employers arrange for medical inspections, including *x* rays, and we believe that this practice, carried out with the active co-operation of the workers, has been successful, and, far from arousing antagonism, has met with approval.

8. Tuberculosis is an old and dangerous enemy. It lies in wait particularly for the young adult, whose services to-day and after the war must be of supreme value to the nation. Moreover, tuberculosis always increases in wartime, and measures must be taken now if the increase that we may expect in the near future is to be stemmed. Our existing tuberculosis services can normally deal with cases of the disease which are sent to them. These services in this country have grown up almost entirely since the last war. They deal with those who have symptoms of disease or who feel ill. But a new advance in the detection and prevention of tuberculosis is now needed. This means finding cases in whom the disease has started but not yet caused the patient to feel ill. Often nothing may be necessary other than careful watching: in some, short treatment is required, but in all cases there is a better hope of eradicating the disease. *X* rays used wisely by competent physicians constitute a very important advance.

9. In this country government proceeds by consent, and anything savouring of compulsory examination would be foreign to our traditions, and would fail at the first attempt. The National Association believes that public opinion can be educated to recognize the needs of the situation, and appeals to the workers, employers, doctors, and other responsible

authorities to consider the facts of tuberculosis as an enemy of youth and a menace to our national health in wartime. A valuable weapon is in our hand—the increased use of *x* rays among all sections of the community, whether they feel ill or not, particularly in the young adults.

10. More careful application will have to be given by the Government and local authorities to the provision of economic security for the tuberculous family, as part of a national scheme of social welfare and rehabilitation. This will have influence on the willingness of tuberculous persons to accept early treatment.

11. There is reason to believe that the *x*-ray manufacturers will shortly be ready to provide apparatus as soon as they receive orders.

BRITISH PHARMACOPOEIA: NOMENCLATURE

The General Medical Council has approved names for certain substances which are now being produced, or are likely shortly to be produced, by British manufacturers, in some instances under licences granted by the Comptroller-General of Patents, Designs, and Trade Marks. These substances have hitherto been known under other names, which are given below together with the names now approved. The question of including these substances in the *British Pharmacopoeia* is under consideration, and if any of them is included the intention is that the approved name given below will be its official title.

Approved Names	*Other Names*
Meprochol	Esmodil
Cyclobarbitone	Phanodorm

It is hoped that the early publication of these approved names will lead to their general adoption.

Reports of Societies

VITAMINS AND HAEMORRHAGIC STATES

At a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on February 10, with Dr. R. D. LAWRENCE presiding, the subject of discussion was "Vitamins and Haemorrhagic States."

Dr. HAROLD SCARBOROUGH said that much of the literature on this subject was confusing and contradictory, owing to injudicious selection of experimental material and not sufficiently frequent examination of the material selected. In order that future experimental results might be more acceptable he suggested that cases should be under close observation for at least seven days before the effect of any material was tested, and should preferably give a history of bleeding extending over at least eight weeks. "Acute" and "symptomatic" cases were in general unsuitable for examination. He also suggested that observations should be made frequently—at least every other day—because alterations of the various functions investigated sometimes occurred with great rapidity and conditions were very transient. Again, the number of these cases in any one centre was not large, and comparatively little would be achieved unless investigations from different sides were co-ordinated. The mechanisms which promoted haematosis were complicated and to some extent unknown.

The effect of vitamin D in controlling the bleeding tendency in certain jaundiced patients had been demonstrated by Ivy and his associates, though this was in some danger of being forgotten in the spate of literature about vitamin K. No satisfactory explanation of the effect of vitamin D was available, but it was well known that the vitamin was capable of increasing the serum calcium, which had a function to fulfil in regard to coagulation, and it might be that on this basis the phenomenon was to be explained, although the mechanism was in doubt.

Dr. Scarborough next briefly discussed the effect of vitamin C on the haemorrhagic state. Generally, a low capillary resistance was found in scurvy, but, save in special circumstances, he had never found ascorbic acid capable of increasing capillary resistance. It did not appear that lack of capillary resistance was due to lack of ascorbic acid. Scurvy was clearly a complex deficiency state, and in certain conditions capillary resistance in scurvy might be temporarily increased. These considerations brought him to the question of vitamin P, a substance (or group of substances) capable of controlling the resistance of the capillary walls in man. The vitamin had been shown to be present in certain fruits, their juices, and extracts made therefrom, but its precise nature was not at present known. By means of experimental feeding tests evidence had been obtained that a clinical syndrome might be produced as a result of a specific deficiency of vitamin P in man. The major feature of this syndrome was petechial bleeding. An exhaustive haematological examination at the time that bleeding occurred revealed a remarkably low capillary resistance and a slightly prolonged bleeding time. It was known that many of the bleeding diseases were associated with a low capillary resistance—that is to say, with excessively fragile capillary walls—and if it could be shown that the development of purpura depended in whole or in part on the excessive fragility of the capillary walls, then the administration of a preparation of vitamin P would be the logical treatment. There was at present little evidence that such therapy was effective, but he described two illustrative cases in elderly women. One, a woman of 75, was admitted to hospital with a history of petechial bleeding, and more recent epistaxis. A preparation of vitamin P was given by mouth, and capillary resistance increased so that during the period, although she was allowed to be up, she was free from petechial bleeding, which recurred, however, when the vitamin P was stopped. The other case was similar. The position seemed to be that the vitamin did in fact exist, that it was not ascorbic acid, but that it could not be regarded as a potent therapeutic agent. Clinical workers must still await the results of the labours of the chemist in the isolation and identification of constituents of fruit juice capable of this activity.

Dr. R. G. MACFARLANE spoke of vitamin K and the estimation of prothrombin. Vitamin K_1 occurred in many plants and vegetables, and K_2 in fish meal, and many compounds had been reported. Haemorrhagic disease of the newborn had shown response to this vitamin. Deficient utilization was said to follow liver damage and to be unresponsive to treatment. It had even been suggested that a response to vitamin K was a sign of reliable liver function. In man hypoprothrombinaemia occurred in a variety of conditions, and response to vitamin K was measured in terms of prothrombin. Accepted methods for this estimation were unsatisfactory, and discrepancies existed between the results obtained by different methods. A derivative of coumarin was thought to be responsible for haemorrhagic sweet-clover disease in animals, and to produce a hypoprothrombinaemia. In man and in animals it had been shown that after administration of coumarin the estimation of prothrombin by Quick's method broke down completely. Quick's test might measure prothrombin, but Russell's viper venom method was more reliable, and if Quick's test was used at all it should not be called the prothrombin index, but rather the accelerated clotting test.

In some further discussion Mr. A. L. BACHARACH gave an account of animal experiments with vitamin P which had shown undoubtedly that, when ascorbic acid failed to improve the purpuric bleeding in deficiency states, the purpuric spots cleared up when vitamin P was given. Such cases had also been seen in clinical practice. In replying to certain questions Dr. SCARBOROUGH said that only certain forms of purpura were susceptible to treatment by vitamin P. The form found in congestive cardiac failure was not susceptible, at least with such preparations of the vitamin as were available now.

TUBERCULOSIS IN YOUNG CHILDREN

A combined meeting of the Tuberculosis and Maternity and Child Welfare Groups of the Society of Medical Officers of Health was held at the London School of Hygiene on February 7. Dr. E. V. SAUNDERS-JACOBS was in the chair and fifty members and visitors were present. Dr. C. N. C. TOUSSAINT (Bermondsey) and Dr. JEAN MACKINTOSH (Aberdeen) spoke on the problems associated with tuberculosis in young children from the clinical and administrative aspects.

Dr. Toussaint said that there was up to the present no increase in the incidence of tuberculosis in young children in England and Wales in spite of the marked rise among young adults. He stressed the risk to which young children were exposed when in contact with an adult suffering from the disease. In his own series of cases an investigation into a number of deaths from tuberculous meningitis showed that as many as 85% had been in contact with an open case of tuberculosis either in a parent or a near relation. Dr. Toussaint expressed the opinion that acute tuberculosis arising in the young adult was usually acquired recently as the result of exposure to infection in office or workshop rather than the flare-up of an old focus contracted in childhood. He thought that children who were exposed to risk in childhood and got a mild, often unnoticed, infection obtained a certain immunity and were unlikely to develop any subsequent general infection.

Dr. Mackintosh, on the other hand, doubted whether any advantage accrued to the child from a previous tuberculous infection. The latest American figures seemed to show that these children were especially liable to develop a recrudescence of the disease in adolescence, especially if their surroundings were unfavourable. Both speakers stressed the danger from the present great increase in the consumption of unpasteurized milk by young children, and thought that measures to ensure that the milk was safe were urgently needed. Where pasteurization was impossible, boiled milk was preferable to raw milk containing tubercle bacilli. Dr. Mackintosh drew attention to the desirability of ascertaining that workers in day nurseries were free from tuberculosis. Dr. Toussaint did not recommend mass radiology for children, but thought that cutaneous tests might be valuable as part of the maternity and child welfare service. The patch test became positive in the early stage of invasion, and such children might receive special care and be investigated with a view to finding the source of infection.

Local News

ENGLAND AND WALES

Hospital Service after the War

The chairman of Charing Cross Hospital announced recently at a luncheon to the Minister of Health that a site for a new Charing Cross Hospital had been bought near St. Giles High Street, W.C.2. Plans have been prepared in the hope of beginning to build when the war is over. The Minister of Health, Mr. Ernest Brown, referred to the recent announcement of the broad lines on which the Government proposes to plan the hospital services after the war, and said: "The first principle is, of course, that the basis of any hospital service must be the welfare of the patient. There has been in the past, and is now, a large measure of devoted service rendered to patients at hospitals of all kinds. I do not think, however, that we can claim that everyone can under the present arrangements readily obtain the treatment they need, or that patients do not sometimes fall between two stools. The second principle of post-war planning is that the Government should put on the major local authorities a duty to secure the provision of an adequate hospital service for their area. In discharging their new duty the local authorities must, of necessity, look for assistance to the voluntary hospitals, whose experience is so extensive and valuable. Above all, the local authorities will look to the large teaching hospitals, whose nature fits them to be the keystone of the arch of the hospital service. There is a great opportunity here for the voluntary hospitals to grasp—an opportunity to play a major part in the future as in the past, on the sure foundation provided by the financial assistance they can expect to receive from the local authorities. I am confident that this is the proper way of securing for the community the continuance of the invaluable contribution made by the voluntary hospitals; and I am confident also that the voluntary hospitals will whole-heartedly co-operate. It is in a true partnership in the fullest sense of the word that local authorities and voluntary hospitals will best serve the patient whose well-being is at stake. The third principle of the Government's policy is to design a service by reference to areas substantially larger than those of individual local authorities, with a proper division of function between the various hospitals in these areas. The Government's policy includes the institution of surveys—one of which has already begun in the London area—to provide a solid basis on which our future planning can rest. The Government recognizes the double responsibility of the teaching hospitals like Charing Cross, as healers of patients and teachers of students. It has given a pledge that in addition to any financial assistance received from local authorities the teaching hospitals will also be given increased educational grants from the Exchequer."

Chadwick Public Lectures

The following lectures have been arranged by the Chadwick Trust on Tuesdays at 2.30 p.m.: March 17, at London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., Dr. W. A. Brend, "Nervous Shock in Peace and War"; April 14, at Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., Mr. D. C. Graham, "Dangers from Rainfall in Urban Areas—Prevention of Flooding of Buildings and its Insanitary Consequences"; May 12, at 26, Portland Place, W., Dr. J. Alison Glover, "The School Medical Service in Wartime." A further lecture will be given at the Chelsea Physic Garden, Swan Walk, Chelsea, S.W., on Thursday, June 18, at 4 p.m., by Mr. E. A. Bowles on "Plants in Relation to Food, Medicine, or Poison." Admission to all the lectures is free and no tickets are required.

IRELAND

Medical Research Council

The Medical Research Council of Ireland made the following awards during the period July 1 to December 31, 1941: (1) Dr. F. J. Geoghegan—Whole-time grant for one year to carry out an investigation (i) of the value of the Hogben pregnancy test, and (ii) of intracranial haemorrhage in the newborn; work to be carried out at the National Maternity Hospital, Dublin, under the direction of Prof. J. McGrath. (2) Dr. Einhart Kawerau—Part-time grant for six months to undertake a survey of the distribution of vitamin C in the Irish natural food products and emergency sources, together with a study of the vitamin supplies and requirements under present conditions; work to be carried out in the Department of Biochemistry, Trinity College, Dublin, under the direction of Prof. W. R. Fearon. Prof. J. Brontë Gatenby—Grant-in-aid to enable him to carry out an investigation into the function of the acrosome in mammalian fertilization. The following grant-holders had their grants renewed for further periods: Mr. P. J. Boyle, Dr. D. K. O'Donovan, Dr. Oliver FitzGerald, Dr. Ninian McI Falkiner, Prof. Hans Sachs, and Dr. R. A. Q. O'Meara. The address of the Council is 85, Merrion Square, Dublin.

Medical Treatment of Evacuated Persons in Northern Ireland

The Ministry of Home Affairs desires that medical practitioners who may be called upon to prescribe medical treatment for persons evacuated to the Reception Area should bear in mind the following considerations affecting such treatment. Arrangements have been made to render the full benefits of all the existing health and welfare services (tuberculosis, maternity and child welfare, etc.) in the Reception Area available to evacuated peoples on exactly the same basis as to normal residents. The return of any evacuated person to an Evacuation Area (in Northern Ireland the County Boroughs of Belfast and Londonderry) for treatment should not be recommended or ordered unless the doctor is satisfied that the necessary treatment is not available in the Reception Area. The return of children to the Evacuation Area for inadequate reasons, in addition to subjecting them to unnecessary risks, prejudices their eligibility for retention on the Government Evacuation Scheme Register.

Dr. Herbert R. Spencer, consulting gynaecologist to University College Hospital, London, left £46,355. After specific bequests amounting to about £27,000, he left the residue of his estate to the Royal Medical Benevolent Fund.

Correspondence

Delay in the Union of Fractures

SIR,—It would seem that there is a general feeling among those concerned with fractures at the present time that delayed union has become relatively common. Prof. T. P. McMurray in his article (January 3, p. 8) emphasizes such an opinion in relation only to the tibia and incriminates the skin-tight plaster. Subsequent correspondence has enlarged the issue. How far there is an absolute increase in slow or incomplete union is difficult to determine. It must be remembered that during the war there is a great increase in the number of fractures coming under observation. They are grouped together, and we are more impatient of slow results than in peacetime. I am not acquainted with any statistics which show the normal period required for union in different bones and in various age periods. The time necessary for sound bone union has been recognized as being variable so long as accurate information on the subject has been available. The factors which determine the period have been variously estimated, and it cannot be said that unanimity on the subject has ever been attained. Certain local conditions are commonly accepted as favouring or prejudicing union, but there always remain sporadic fractures in which the cause of delay or failure is a matter of speculation. We have, in fact, no scientific standard with which to compare our present results. This being the case, any assessment in this relationship is drawn up on a background of impressions only—an unsatisfactory basis on which to found practice. The necessary figures to give us a datum line may be forthcoming; if not, let us hope that information will be collected for future use at the various fracture centres now established in this country. Under the controlled conditions of war the keeping of accurate records with a proper follow-up should not be difficult.

If, as it would appear then, our current practice must be guided by observation of present injuries contrasted with impressions acquired by experience or from textbooks, I will venture my own views on the subject, confining my remarks to simple or non-infected open fractures of the shafts of long bones.

I think delayed union in fractures of the femur and tibia has been more in evidence for the past ten years than it was in the previous twenty. I am inclined to think that the same may be said of fractures of the shafts of the radius and ulna. I believe this has resulted from the use of methods which interfere at different stages of the repair process with the normal blood and lymph circulation in the injured part. I can see no evidence that dietetic deficiency plays any part in the matter.

During the period in question surgeons have sought for greater anatomical perfection in reduction of the fragments: a natural and proper ideal, and one encouraged by the interest the patient, and even the lawyer, take in radiographs. The most direct—and, to the surgeon, attractive—means of achieving this end by open operation and osteosynthesis has fallen into disrepute, in this country at least, for reasons I need not go into here. The mechanical methods that have been in vogue and which are now intensively employed are skeletal traction and the complete skin-tight plaster. I believe that both these methods, unless used with discretion, have it in their power to prejudice normal callus formation and ossification. In cases in which skeletal traction is in action it is a commonplace to see in the radiographs over-distraction of the fragments to the extent of half an inch or more. Such over-distraction must involve tension on the tissues destined to form callus around the fracture. It is probably unimportant in the first few days after injury, but probably of greater significance as the haematoma is converted into granulation tissue and callus. Moreover, heavy long-axis traction increases the pressure within the aponeurotic sheath of the limb under tension. This statement can be checked by digital sense at open operations on broken bones. It seems reasonable to suppose that both traction and increased intra-aponeurotic pressure must diminish the normal circulation in the fracture area.

The skin-tight plaster applied over a fracture in which some reactionary swelling has already occurred has probably no serious effect on the capillary circulation within the limb. If, however, the plaster is applied while traction is being exerted, or before reactionary effusion of blood and serum has occurred, the pressure induced may be very great. The gross evidence of this is in the production of pressure sores which are seen from time to time. It is evident, I think, that heavy traction and severe compression induce a state about a fracture that is far from natural. The surgeon should always adapt himself to and not offend the conditions conducive to normal repair.

It is not possible within the scope of a letter to state fully the arguments on this question. I would say that I agree with Prof. McMurray in considering that absolute immobilization of fractures is not essential to bony union. To those who have seen these injuries treated by the Lucas Championniere method it may seem unnecessary to make such a statement, but there appears to be a school of thought in the fracture world to-day which emphasizes the necessity for rigid and continuous fixation till bone union is firm.

If the above thesis be accepted one can lay down advice in regard to the treatment of fractures in which impaction is not present or where osteosynthesis or coaptation and fixation by the Roger Anderson method is not employed. First in regard to skeletal traction, over-distraction of the fragments, except in the period immediately following the injury, should not be allowed. Heavy traction should be limited to as short a period as possible. Secondly, the potential dangers of skin-tight encircling plasters should be recognized. This type of plaster should always be split through its whole length if there is any likelihood of pressure developing beneath it after its application either from haemorrhage, or serous effusion, or inflammation.

I think that if these practical considerations are borne in mind and applied in practice we may see a diminution of our present discontents with the treatment of fractures of the long bones.—I am, etc.,

Cambridge. C. MAX PAGE.

Spinal Anaesthesia

SIR,—With regard to recent correspondence on the merits and demerits of spinal anaesthesia the following points would seem to be of importance.

1. A spinal anaesthetic can be administered with ease and speed. If it were suitable for all cases it would be the ideal anaesthetic, but unfortunately there are definite contraindications, and it is the disregard of these which leads to fatalities and consequent unpopularity of the method even among those who originally were its most enthusiastic supporters. I think all authorities are agreed that it is not a method to be used in "poor risk" cases—for example, where shock, haemorrhage, or advanced cachexia are predominant features. Nor should it be used in cases of gross abdominal distension—Caesarean section is the outstanding example of this. I am aware that many workers do not agree on this point and quote long series of successful cases. Nevertheless, fatalities do occur, and the risk does not seem to be justifiable.

2. None of your correspondents has brought out the point that technique should be adapted to the particular operation contemplated. I agree with Mr. Stanley Hillman (February 14, p. 237) that the Etherington-Wilson technique with light percaine is excellent for upper- or mid-abdominal work; for lower abdominal work, especially operations on the perineum, I prefer a hyperbaric solution as being more selective in action for this area. For such operations as nephrectomy or procedures on the lower limb I find a so-called unilateral spinal (in practice there is always a certain amount of diffusion to the other side) has definite advantages over the Etherington-Wilson technique in that excellent anaesthesia and relaxation are combined with a minimum of vasomotor disturbance.

3. Finally, whatever method of spinal anaesthesia is chosen, I am convinced that patients should be unconscious both for the lumbar puncture and during the subsequent operation. Any suitable form of light general narcosis may be used, but the quick-acting barbiturates, such as evipan or pentothal, are of especial value when the anaesthetist is working single-handed. Shock due to psychic trauma is thus reduced; and nausea and vomiting, often troublesome features in the conscious patient, are obviated. The incidence of post-operative headache and

backache is also greatly diminished. This is particularly the case if the patient is unaware that he has had a spinal anaesthetic.—I am, etc.,

London, S.W.1. HELEN BOWER ALCOCK.

Meningitis after Spinal Analgesia

SIR,—It is generally recognized that the incidence of meningismus and meningitis following spinal analgesia has recently increased in this country. While some of these cases are probably due to chemical irritation of the meninges from the injected drug, others have been proved to be infective, and various causes, such as contamination of the water supply, have been blamed. The purpose of this letter is to point out a possible source of infection which seems to be insufficiently recognized. Before the war manufacturers used ampoules with particulars of their contents etched on the glass. Such ampoules could readily be sterilized. It appears, however, that the etching process is no longer available, and makers have resorted to gumming printed labels on their ampoules. It is, we believe, a common practice to immerse these ampoules in spirit in order to sterilize the outer surface. We have found that after immersion for half an hour—a longer period than that sometimes employed—numerous bacteria can be cultivated from fluid in which the labels have subsequently been soaked off. If, therefore, an ampoule so treated is placed in the same bowl of sterile water as the spinal needles and syringes, it will contaminate them, and if the ampoule is held in the hand it may infect the anaesthetist's gloves. Exposure to formaldehyde vapour in a cabinet such as that used for sterilizing catheters is apparently an effective method of sterilization, but, since such a process is often impracticable, it would seem advisable to regard the outside of all labelled ampoules as frankly septic and make no attempt to sterilize them. They can be held in a sterile towel or gauze, their necks etherized, nicked with a sterile file, and snapped off. The contained solution can then be drawn up into the syringe without fear of contamination. A few organisms may not matter in subcutaneous or intravenous injections; in intrathecal ones they may prove fatal.—We are, etc.,

C. LANGTON HEWER.
St. Albans. LAWRENCE P. GARROD.

The Teaching of Anatomy

SIR,—The letter in the *Journal* of February 7 (p. 196) from a group of five anatomists is certain to evoke criticism and comment from clinicians as well as from fellow anatomists. In so far as it indicates that anatomists as a body are fully alive to the desirability of improving the curriculum and are actively considering the means whereby "the best possible education for the general practitioner" may be provided, the letter will be endorsed by all their colleagues. On the other hand, it is very doubtful whether some of the constructive suggestions put forward to attain the end in view will receive an equally warm welcome.

The charge that anatomists lay too much stress on topographical detail is an old one, and was repeatedly made, with some justice, in the course of the prolonged discussions on the medical curriculum which followed the last war. It is unfortunate that the letter in question should give the impression that no improvement had been effected in this respect, for there has been a very striking reorientation in the outlook of the anatomists in the past twenty years, and the great majority of us have long ceased to lecture or to examine on matters of topographical detail. It should be stated most emphatically that the anatomist of to-day attaches little value to detail, and is much more concerned to teach the anatomy of the living body and the principles which are inherent in the relationships which exist between structure and function.

Despite this, it must be admitted that the student still devotes a quite unjustifiable proportion of his time to the acquisition of a knowledge of topographical detail. When Prof. Appleton and his co-signatories suggest that the first step to remedy this state of affairs is to modify the character of the questions set in written examination papers in anatomy, they are, I think, tackling the problem from the wrong end. When he first enters the anatomy department the student doesn't concern himself with the character of the examination for which he must in due time present himself, but none the less he devotes a great deal of time in his first term to mastering—often with astonishing success—a mass of topographical detail. He does this for two reasons. In the first place, he receives the bulk of his instruction from junior demonstrators, many of whom are aiming at a career in general surgery, or one of its branches, and whose estimate of the relative values of anatomical information is naturally quite different from that of the professional anatomist. In the second place, the contents of the dissecting manuals in common use confirm the impression obtained from the demonstrators that a knowledge of human anatomy implies familiarity with a mass of minute detail. It is true that the remedies lie in the hands of the anatomists themselves. Unfortunately, the field of human anatomy is not large enough to offer careers to all the young men whose services are required as demonstrators, so that in this respect we must always be dependent to a large extent on men whose chief interests are surgical and who have had little experience and no training in teaching. In the past we have rarely done more than give some perfunctory instruction and advice to the junior members of our staffs, but if the evil tradition of the importance of topographical detail with its senseless mnemonics is to be wiped out, professors of anatomy must be prepared in future to devote some of their time to the training of their own junior demonstrators.

Unless the student is constantly reminded that the real aim of his work in the dissecting room is to acquire some knowledge of the anatomy of the living body his energies are exclusively concentrated on the dissected specimen, and it is a common experience to find that he resents a *viva voce* examination conducted on the living subject and not on the cadaver. If we are to give due weight to the fact that the majority of our students will take up general practice, it is this aspect of the teaching of human anatomy which calls for much more attention than it has ever received.

I am far from being convinced that in the present state of our knowledge we should be justified in laying more stress on such subjects as morphogenetic mechanisms or the influence of hormonal factors in the induction of structural modification, and I cannot think that a *course* of lectures in human genetics (the italics are mine) is a desirable addition to an already overburdened curriculum. On the other hand, most anatomists will be in full sympathy with the suggestion that more instruction should be given in the important subject of post-natal growth. It has always been an anomaly that the student should be given the opportunities of acquiring a good knowledge of ante-natal development and of the anatomy of the adult, and that little or no attempt should be made to bridge the gap between.

The systematization of the teaching of topographical anatomy which the signatories of the letter advocate—without question the ideal plan—would almost certainly entail the limitation of the entry of students into the departments of anatomy and physiology to once instead of twice a year. It will be necessary to overcome considerable opposition from a number of different quarters before such a welcome change can be effected, but the inherent advantages, to student and teacher alike, would be so great as to make the attempt to effect it well worth while. The proposal will, I feel sure, have the unanimous support of all the teachers of pre-clinical subjects.—I am, etc.,

Medical School, Guy's Hospital. T. B. JOHNSTON.

SIR,—The letter by Prof. A. B. Appleton and others (February 7, p. 196) on "The Teaching of Anatomy" is timely, and will have been read by many with approval of its general tenor.

Looking back over some twenty-five years of teaching in anatomy I can see that the present-day student has to learn even more topographical detail than was formerly required, as well as to assimilate more embryology and much radiological and neurological anatomy. To relieve the student of some of the burden laid on him by this crowded curriculum seems the chief need, and to do this, unnecessary topographical detail as well as detailed development of organs must go.

There is, however, one point I would stress, and that is that the student, during his second M.B. course, should dissect the whole body, as he does at present.

Further, I would like to propose that in planning any modification of the curriculum in human anatomy co-operation with

the biologist should be sought. Important as is the study of the factors concerned in growth processes, it is of equal importance to give the student time for thought. We shall do him no service if the time that is set free by elimination of topographical detail be entirely taken up by the proposed new courses. I therefore suggest (with the concurrence of my colleague in the biology department) that considerable modifications in the biology syllabus, and still more of the examination questions in this subject, would be beneficial. A good deal of the teaching of details of plant and animal morphology might give place to preliminary instruction in the principles of morphogenesis in its widest sense. The course in biology for a medical student should include the teaching of such basic principles, and this not merely because knowledge of them has been attained very largely by experimental work on lower forms. The further study of growth processes, especially their human manifestations, could then be included in the anatomy course to its great advantage and without overloading.—I am, etc.,

MARY F. LUCAS KEENE.

London (Royal Free Hospital) School of Medicine for Women.

SIR,—It is with profound gratification that one sees this lead in aligning the teaching of anatomy with the progress of clinical medicine. The purpose of the qualifying examination for entering our profession is to safeguard the public and ensure that the graduate has the technical knowledge competently to enter upon general practice. Nowadays this does not entail general carpentry to the body. Owing to the prodigious elaboration of various branches of medicine in the past fifty years it is necessary to equip the student with a much wider range of knowledge if the patient is to get the benefit. He must know something of the rudiments of such new spheres of importance as radio-diagnosis and therapy, of vitamins, endocrines, psychology, modern surgery of central and sympathetic nervous systems, of urology, and the cult of health as the best "cure" for disease. These are but a few concrete examples of how burdensome his studies have become. As he digs more widely he cannot dig so deeply in the same time. Intelligence and foresight demand modification of the curriculum from time to time.

None doubt that the structure of the body is the necessary foundation of our subject, but while we can name off-hand many admirable doctors, can we guarantee one who could map out the anastomosis round the knee-joint or its capsular and muscular attachments? No; a good doctor does not need such detailed anatomy, or to know the cranial foramina and what each transmits. To no advantage are the student's youthful years busied with such structural details. If, after qualifying as a doctor, he decides on anatomy or surgery as a specialist career, then is the time for such facts to be acquired. All the family doctor needs to know is about the subject in a general way—for example, that there are numerous anastomosing articular vessels the multiplicity of which corresponds to the adjacent bone factories in youth and to synovial secretions always, and to realize the susceptibility of such to infective processes. *Per contra*, there are directions calling for accentuation—for example, the diverse positions of the appendix, a knowledge of which might save many good lives annually; or the significance of one particular foramen (ovale) of the skull in relieving victims of the torture of tic douloureux.

As your correspondents, in effect, say: "New ground needs to be broken." How many students see the male urethra slit open and have emphasized to them the bearing of its structure on instrumentation? Its dissection is apt to be staged too late, when it is shrivelled and dry. If they watched the junior doctor struggling with an instrument and the patient's expression, it would raise intense interest in the internal anatomy of a part that is constantly the site of medical attention in hospitals and not rarely in general practice. How efficacious it would be to watch, through a skiagraphic screen, the passage of an opaque meal during the week for dissection of the cadaveric bowel! This additionally exemplifies the necessity for the congregation of the many branches of medical instruction. Fruitful collaboration requires ready intercourse. Distance curtails it. All the departments that compose a teaching hospital should be grouped together on a single site at our new regional medical centres. Not only in anatomy, but in physiology, pathology, and other laboratory studies this lesson applies. They are intruding too far into the student's arena, to the exclusion of the proper needs of the practitioner, who is first and foremost a master of clinical study and personal contact with patients. "You can't," quoting Sir Robert Hutchison, "have the terriers too soon at the rats!"

Five years is quite long enough for a student's career. Qualification confers responsibility and earning capacity, and spurs a man on. It would not, as at present, empower the young doctor to set up on his own account in independent practice. This imprudence would be stopped by regulations requiring at least one year's further handling of patients under skilled supervision; and, before being allowed to engage in the one-man practice which will still remain in isolated country districts, he would have to do at least two to three years' assistantship.

The signatories of your letter are to be congratulated on lighting the torch of long overdue general reform of medical education.—I am, etc.,

Bristol. A. WILFRID ADAMS.

Declining Population

SIR,—There are two references in the *Supplement* of February 14 to my statement as to the decline of population—one by Dr. C. E. S. Flemming and one by Dr. B. Dunlop. I agree with the former that our doctor power ought to be increased and used to better effect. As to the optimum number of medical practitioners required per 1,000 of population there may well be some dispute, but on the facts of the decline of population there is no doubt. No action by Parliament or anyone else can now prevent this during the next generation. Immigration on an extensive and permanent scale might, of course, affect it, but there is no prospect of this, and modern tendencies are to restrict rather than to encourage influx from this source.

The estimate which I quoted of a decline in the total population of England and Wales by 3,540,000 by the year 1965 is the most conservative of the careful calculations that have been made with regard to this decline. It is not directly dependent on the differences between the birth rate and the death rate, as Dr. Dunlop seems to assume, but upon the net "fertility" or reproduction rate. This is now definitely well below 0.75. Your columns are probably not just now open to an adequate discussion or exposition of this, though note should be taken of Dr. W. G. Willoughby's valuable letter in the *Journal* of February 7 (p. 196). May I be permitted to refer, however, to *The Twilight of Parenthood*, by Dr. Enid Charles (1934), to *Education and the Birth Rate*, by Dr. G. G. Leybourne and Mr. K. White (1940), and to an address of mine printed in the *Journal* of October 24, 1936?—I am, etc.,

HENRY B. BRACKENBURY.

Infective Hepatitis

SIR,—The article by Dr. J. L. Newman on infective hepatitis (January 17, p. 61) and the letter by Dr. S. A. Propert (February 7, p. 197) have raised many interesting points, and I am prompted to communicate details of a small epidemic of jaundice which has broken out in a pavilion of Mearnskirk Hospital. The pavilion, consisting of two wards separated by a long corridor, contains children who are the subjects of surgical tuberculosis or of the residual effects of anterior poliomyelitis.

The first instance of jaundice occurred in a child of 4 years of age. On January 9 he complained of shivering, sickness, and vomiting. On the following day the urine was noted to contain bile, and clinical jaundice thereafter became evident. Three days later the faeces were clay-coloured. Nausea and anorexia persisted for four days; bile disappeared from the urine on January 16. The next case was seen in the opposite ward in a child of the same age, who became sick and vomited on January 10, but who subsequently remained well until January 25, when he vomited again, but on only one occasion. A third attack of vomiting took place on January 31, and on the following day bile appeared in the urine, clinical jaundice developing the day after. The jaundice was again of mild degree, and the patient made an uneventful recovery. The urine was free of bile on February 7. The faeces had maintained an unaltered colour throughout the illness.

A child aged 8 in the same ward as that of the original case became sick and vomited on January 17. He was off his food for one day only, and no bile was detected in the urine at any time. The fourth and fifth examples were seen in a male child

of 9 and a female child of 5, who occupied beds in opposite wards. Simultaneously they became sick and vomited on January 25, and bile was present in the urine of both next day. While the faeces of the former were unchanged, the girl's were clay-coloured. The urines became normal on February 7. Two other children were observed to have a bout of nausea and vomiting on January 26 and January 28, respectively, but no further developments occurred. On January 31 a female child aged 8 complained of abdominal pain, nausea, and vomiting. The pain disappeared after a day, but the gastric symptoms persisted for a whole week, although no bile was found in the urine and no jaundice appeared.

The most recently affected child began his illness on February 2, when he vomited, this procedure being repeated three days later, and on the 6th bile was present in the urine and the faeces became clay-coloured.

The disease has been of a mild type. All the subjects were afebrile during the acute phase, and no alarming symptoms were observed. The initial stage of the illness was marked by an acute gastric upset, and it is a reasonable assumption that, when this occurred in the absence of the development of jaundice at a later date, it represented an abortive form of the malady. The repeated incidence of nausea and vomiting in some, with intervals of a few days' freedom between the attacks, is more difficult to explain, and would seem to correspond with the relapsing type described in Newman's paper. An outstanding feature was the nature of the motion, which in the majority of cases gave proof of obstruction of the bile ducts. That this feature can be of variable degree is shown by the difference in the stools of the two cases which had a simultaneous onset on January 26.

The origin of the epidemic is difficult to trace, since, according to the relatives visiting the wards, numerous children with whom they came in contact outside are at present suffering from jaundice and offer an aetiological source. It is not possible therefore to be dogmatic on such questions as the infectivity of the disease within the wards or the period of incubation. That jaundice is prevalent in many parts of Scotland can be inferred from the large number of examples seen in adults admitted to this hospital within recent weeks. One adult patient, transferred from a hospital in the north of Scotland, stated that about half the patients of the ward he occupied were the subjects of jaundice.—I am, etc.,

Newton Mearns. J. SHAFAR, M.D.

Tuberculosis in Childhood

SIR,—It may be useful to summarize some of the facts which have emerged in recent years from investigations upon tuberculosis in childhood.

(1) The diagnosis of intrathoracic tuberculous infection, which is nearly always due to intimate and continued contact with an actively tuberculous adult, has been greatly aided by the examination of gastric contents, as detailed in the paper by Drs. T. W. Davies and C. J. Doherty (February 14, p. 212). Needless to say, there are possible fallacies to be guarded against; and the result of the examination, whether positive or negative, must be assessed critically with all the other evidence available, especially a study of the environment of the child, clinical examination, tuberculin testing, and radiological examination.

(2) By the full examination detailed above, many cases of tuberculous infection which would otherwise be diagnosed as bronchitis, pneumonia, unexplained pyrexia, erythema nodosum, etc., are revealed. This point was emphasized in the results of an investigation (*Acta Paediatrica*, 1937, **22**, 235) which I carried out upon 200 children, 190 of whom were submitted to gastric lavage, with 46 positive results (guinea-pig inoculation).

(3) Primary tuberculous infection is common in infants and children, and in many cases there is satisfactory recovery, especially if the child's contact with the source of infection is broken. Both local and general reactions are frequently so trivial that the fact of infection may be unrecognizable without full investigation (*Proc. roy. Soc. Med.* (Dis. of Ch.), 1940, p. 17). This is undoubtedly the explanation of the apparent disparity between pathological and clinical reports which puzzled earlier workers. At routine necropsies upon children who had died of non-tuberculous diseases calcified foci were frequently found in bronchial and mediastinal glands as well as in the lungs; while clinicians contended that intrathoracic tuberculous disease in infants and young children was usually fatal. It is still accepted that the danger of tuberculous infection becoming progressive tuberculous disease is greater the younger the child; but we now know that the unaided clinical methods of our predecessors could not with certainty reveal any focus of tuberculosis which was not extensive and progressive, and therefore the clinical viewpoint was obscured by inability to recognize as tuberculous those examples which were not soon to become fatal.

(4) The full investigation necessary to exclude tuberculosis in childhood is costly and time-consuming; it is therefore reasonable to ask whether even in peacetime the results justify the expense and labour. I shall not attempt to give a full answer to the question, but I must call attention to the signal part played by modern methods of investigation in unmasking the presence of a tuberculous adult in the child's immediate environment. It is true that there may be difficulty in recognizing which of the adults in attendance upon the child is the source of infection, for to do this there must be clinical and radiological examination of each suspect; and it is equally true that, for one reason or another, the discovery of the affected adult may not be followed by his or her segregation from the child-patient and other children. But at least the basic facts of the situation are illuminated and prophylaxis becomes a possibility.

(5) There is little evidence that a child with primary intrathoracic tuberculous infection is dangerous to others, unless he has, at the same time, a disease such as whooping-cough.

(6) The diagnosis of intrathoracic tuberculous infection is often difficult in childhood, even when one has the advantage of full investigations. This is due partly to the pathology of primary tuberculosis and partly to the age of the patient. In all cases it is for the clinician to make a critical appraisal of all the facts available, for he alone is in a position to assess the relative value of the evidence.—I am, etc.,

Liverpool. NORMAN B. CAPON.

Increase in Tuberculosis

SIR,—It is a remarkable fact that even sixty years after the discovery of the tubercle bacillus there should still be wide diversity of opinion as to its infective power, and yet it would appear to me to be a comparatively simple matter for the question of marital infection to be settled by the compilation of statistics based on large numbers. That tuberculosis between husband and wife is uncommon has been a long-sustained belief, a belief that has had the favourable opinion of several eminent authorities. Indeed, a few months after Koch announced his discovery Burney Yeo wrote an article on "The Contagiousness of Pulmonary Consumption" (*British Medical Journal*, June 17, 1882), in which the conveyance of phthisis from husband to wife and from wife to husband, particularly among the poorer classes, was discussed; he expressed the opinion that the conveyance of the disease from one to the other was a rare occurrence. He added: "It seems certain that the communication of consumption from wife to husband, even among the class in which the conditions of life favour to the utmost the communication of contagious disease, is very rare, while it would seem that communication (assuming for the sake of argument the disease really was communicated) from husband to wife is more frequent." At a later date the available statistics were carefully analysed by Pope, Pearson, Goring, and others, with essentially the same conclusion. Indeed, Goring came to the decision that for the poor of all classes there appeared to be no greater chance of the mate of a tuberculous person being tuberculous than of any other person (Pearson: *Tuberculosis, Heredity, and Environment*, 1912). Such an opinion might be regarded as valid thirty years ago, when the tuberculosis scheme was barely inaugurated and the large-scale examination of contacts aided by radiography virtually unknown. It is an opinion I do not share, and I venture to say that when this war is over the time will be ripe for the making of a national survey of this problem; and I would suggest that the National Association for the Prevention of Tuberculosis add it to the number of their valuable contributions to the social aspect of tuberculosis. The work could be done by obtaining the co-operation of all the tuberculosis officers in the kingdom.

While strongly deprecating the attitude of those who shun the open case of tuberculosis as a pariah, I would as strongly deprecate the view that massive continuous infection between adults, particularly young adults, is innocuous. I saw a few months ago a young woman aged 27 who had had a cough for six months with gradual failure in health. Her sputum was positive, and there was manifest disease in the right lung. Her own family history was negative, but she informed me that for three years she had been keeping house for, and generally looking after, her mother-in-law, who had died from pulmonary tuberculosis only two months previously. The old lady had always refused to allow a window to be opened or to do anything to mitigate infection. Am I to believe that the myriads of tubercle bacilli inhaled by the daughter-in-law had nothing to do with the disease that came upon her? Would the result have been the same if she had never been brought into such a highly infected atmosphere? Or, what opinion am I to form when an office clerk aged 30 with early pulmonary tuberculosis and negative family history informs me that for several years he has worked in a small office with an elderly man who has just died from pulmonary tuberculosis and whose name has been on my records for about twenty years? Chance? I wonder. The soil is important certainly, but let us not forget the seed.—I am, etc.,

A. OGG,
Wolverhampton. Tuberculosis Officer.

SIR,—Following the correspondence on this subject by Drs. V. S. Hodson (January '17, p. 89), J. E. Wallace and Rose Jordan (January 31, p. 163), and L. Roberts (February 7, p. 198) I would suggest that the radiological aspects of this disease might give a clue to these observers or exponents of the method of adult infection.

As a radiologist I have been a seeker of the truth in this matter for many years and have based my observations on almost daily radiological examinations of both infected and contact cases. Excluding the cases of reactivation of an already existing lesion and the haematogenous spreads, I am a confirmed believer in the exogenous or aerogenous method of adult infection. Pulmonary tuberculosis, I am convinced, is essentially an infection from without via the bronchial tree. The clue to this lies in the early infection.

I would welcome any other rational explanation of the undermentioned facts which have convinced me of the exogenous mode of infection. Space does not admit of detailed statistics, but there are certain facts about early infection upon which, I think, most observers will agree.

A definite seat of election is the upper lobe, usually in the region of the second and third interspaces. In order of frequency, I should say: right upper lobe, left upper lobe, both upper lobes. The area was described by Assman as a lesion deep in the middle of the upper lobe in the neighbourhood of the lateral and dorsal ramifications of the subapical branch of the posterior upper lobe bronchus. There are a few exceptions to this early seat of election, but these only go to prove the rule.

Why this particular bronchus? Surely the explanation lies in:

(*a*) The upper lobe bronchus is nearest to the entry of the respiratory passages.

(*b*) If lipiodol is injected into the trachea and the patient made to cough it is most readily expelled into the upper lobe bronchus and its ramifications.

(*c*) Most people lie on their right side, hence the frequency of the right upper lobe.

(*d*) Opaque media, when they enter the alveoli, form a cast of the acini indistinguishable from the acini-nodose type of pulmonary tuberculosis.

(*e*) The angulation of the right main bronchus is less acute than any other, which facilitates the entry of infected media, especially in the expiratory effort of coughing.

(*f*) The lymph stream is centripetal, so that infected hilar glands are not likely to cause such an infection.

(*g*) Haematogenous spreads are easily recognizable and have no seat of election.

(*h*) Engel has shown that the bronchial glands are in closer relation to the pulmonary vessels than the bronchi, and are, therefore, more likely to cause a haematogenous spread.

(*i*) The apex is the most immobile part of the lung.

There is a flaw in the argument. Couldn't an endogenous infection reach the trachea and then follow the above path? I admit this, but why manifest itself in this site and not at its site of origin? Similarly, in contralateral spreads the cough expels the media into the path of least resistance—namely, the upper lobe bronchus. I agree with Dr. Hodson in his statement that few, if any, of his contacts have developed pulmonary tuberculosis, and I find the same, but this does not convince me that adult to adult is the commonest mode of infection. The explanation, I think, is the suitability of the soil in the contact—for example, the degree of immunity and the presence or absence of resistance-lowering factors. Hence the increase during war conditions. The contact, although the victim of circumstance, is more the victim of his own soil.—I am, etc.,

Hull. J. E. BANNEN, M.B., F.F.R., D.M.R.E.

Gastric Lavage in Pulmonary Tuberculosis

SIR,—Drs. T. W. Davies and C. J. Doherty (February 14, p. 212) rightly stress the importance of examination of the gastric contents in the diagnosis of pulmonary tuberculosis in children. My first experience of the method was ten years ago at the Yardley Road Sanatorium, Birmingham, where Dr. G. B. Dixon made use of this investigation as a routine in all doubtful pulmonary cases in children, and I was then impressed by its efficacy, which led me later to introduce the method at the Adelina Patti Hospital. More recently American writers have advocated the extension of the method to adults in cases where there is no sputum or, more correctly, insufficient sputum for expectoration. It is true that examination of the faeces for tubercle bacilli in these cases often gives positive results, but this method cannot be considered so reliable for obvious reasons.

When assessing the result of treatment such as artificial pneumothorax the fact that the patient has no sputum may be misleading, whereas gastric lavage may reveal the presence of tubercle bacilli, indicating active disease and the necessity for prolonging the treatment. The method at least deserves further trial in this country.—I am, etc.,

Welsh Memorial Clinic, Haverfordwest. D. IVOR A. WILLIAMS.

Group Psychotherapy

SIR,—Dr. J. Bierer's interesting article (February 14, p. 214) will, I hope, form a nucleus for the development of a form of psychological treatment which is very necessary in these days of limited time, multiple anxieties, and fluctuating attitudes. It might be of service to others contemplating this form of therapy to give my experience as a general practitioner with special leaning towards treatment through the mind.

During 1938 I arranged a scheme of subdivision of my consultation time on certain days in such a way that those requiring psychological treatment (called here Ψ patients) took a card from the surgery attendant on arriving and waited until all requiring physical treatment (called hereinafter Φ patients) had been seen. To Φ patients I allotted ten minutes each by automatic clock. Meanwhile Ψ patients waited in an "upper room" and made friends with each other, perused suitable books from an arranged library from which they could borrow for a small fee, and agreed on the group subject (social, personal, sexual) which was to be discussed. Slips of paper were available, on which each wrote any subdivision of the subject (list of numbered questions was provided) that he or (mostly) she wished embodied.

After all Φ were satisfactorily attended I went to the Ψ room and gave an impromptu talk embodying both helpful suggestions and general re-education, touching, in passing, on the minor topics requested on the slips. After the talk, questions were asked, and great freedom was allowed in expression of views. Sometimes a patient found she could give at a group a better idea of her point of view than she could at a personal interview. But if any patients desired to see me afterwards for elucidation of private material I would see them privately, when I found a good deal of progress had been made from the time they had had only individual treatment. (Cost of the card, 5s., covered this interview. If no interview was requested the card would admit to a second talk.)

These groups continued for some weeks after the air raids started, and I was amazed at the persistence with which members would return from communal shelters to continue their discussion. As I could not obtain a special air-raid shelter site

for regular Ψ groups I availed myself of the offer of one member to use her Anderson shelter, and thus a small though permanent group of four has kept up its Saturday night "group" at fortnightly intervals for fifteen months. During this time the meeting has been held in one or other of the members' homes, where I would attend and afterwards ride home through air raid or the black-out while the members have remained to sleep.

This remnant of several Ψ groups came to be called "The Group" and developed many ancillary functions. A social side was made by occasional invitation of relatives or friends; all started to learn some form of music or social entertainment as a contribution for social occasions. The members visited other bodies studying religious, social, or local problems in settlements, clubs, technical institutes. One member volunteered and mothered a number of refugees in a local church hall, attending to catering and entertainment. One member contributed voluntary nursing at the local hospital. Another found herself to her surprise helping worried girls in her war factory. They all made comforts for the troops, and consulted each other in my absence about their own family problems. Thus the group has become a small but vitally alive nucleus in local society, and may prove valuable as a reintegrating factor in post-war conditions of instability. All these members were strongly individualistic and had spent untold hours of consultation time in analysing with me their own personal difficulties and emotional tangles. Now they are useful members of society and are likely to remain so.

As we have had no air raids for many months members of former groups have requested that I should consider their case. They had no home facilities for holding a "group." In order to meet this obvious need I started a "psychological class" once a month, and with eight members it has had two successful sessions. This is a study class. We use as a basis a simple introductory book, *Psychology for Everyman*, by Mander (Thinker's Library, Watts), and I set a certain quota for the month's reading. Each student has to find books in the local library or where she can to supplement the subject-matter set, and the little minor talks by members after I have set the ball rolling give interesting sidelights that are astonishing. Expense is covered by each student contributing 1s. 6d. at each session and 3d. a week for each volume borrowed from the library.

At the Medical Society of Individual Psychology in 1940 I was able, speaking from the floor, to outline my scheme, and was much gratified to have the blessing of that doyen of British psychologists Dr. Hadfield, who then stated that he thought insufficient attention had been paid to group psychotherapy and encouraged me to continue with my experimental scheme.—I am, etc.,

Walthamstow. A. C. D. TELFER.

SIR,—Dr. J. Bierer's article on "Group Psychotherapy" was a singular mixture of the practical and the ingenuous. Of his more extensive use of occupational therapy and social activities in general for neurotic and early psychotic cases there will, I am sure, be general approbation. But as one who believes in the special need for accuracy and the scientific approach in dealing with psychotherapeutic problems I should be glad of further information on the following points.

Dr. Bierer treated seventy neurotic and early psychotic patients in one year by "deep and intensive psychotherapy." Using ordinary analytic methods this would be a distinctly Herculean achievement which, I imagine, would daunt even the most energetic psychotherapist. But Dr. Bierer claims to have developed a shortened method of analysis by asking the patients to write down their earliest childhood recollections, their aims and ambitions (especially between the ages of 10 and 14), their likes, dislikes, and dreams. Does he really expect experienced psychotherapists to accept that by this procedure he can obtain any deep insight into the "subconscious background"? If so, will he give us an idea as to what depth of the mind this method actually enabled him to penetrate? Did he regularly expose significant oedipal relationships, for example, or defence mechanisms or oral-erotic fixations? By "expose" I mean did he elicit the necessary evidence for a scientific judgment and not merely jump to conclusions from superficial indications? To take an example in the woman of 26 who suffered from claustrophobia, on Dr. Bierer's own showing she was dull, shy, unintelligent, and unsociable. Did he obtain much deep information from a patient of this type by asking her to write down her childhood recollections, aims, etc.? The facts he mentions might readily have been obtained by a detailed anamnesis, and he very properly made use of his knowledge to make her what she wanted to be, a teacher of physical training. Assuming that this patient got quite well, would Dr. Bierer claim the case as "cured" or as "recovered"?—I am, etc.,

London, W.1. FREDERICK DILLON.

Diagnosis of Doubtful Whooping-cough

SIR,—I was particularly interested in the "Epidemiological Notes" in your issue of January 17 (p. 97), especially with reference to whooping-cough. Comparing the statistics published of diphtheria and whooping-cough, it is obvious that the latter condition is almost as serious as diphtheria from the point of view of mortality. As the result of some researches made in collaboration with Prof. J. W. McLeod, Brotherton Professor of Bacteriology in the University of Leeds, on cases of mine met with in general practice (*Lancet*, 1929, **2**, 165) we showed that the bacteriological diagnosis of whooping-cough was of definite assistance for the clinical diagnosis, and came to the conclusion that the bacteriological diagnosis, if generally adopted, could be of practical service to the community. Of particular importance in the spread of whooping-cough are those cases which are clinically doubtful and which might be a serious source of contagion. It is suggested, therefore, that practitioners should avail themselves of the opportunity in seeking the help of the bacteriological laboratory for the accurate diagnosis of these cases.—I am, etc.,

Leeds. HARRY SUGARE, M.D.

"Ether Convulsions"

SIR,—Dr. Massey Dawkins (February 14, p. 238) asks whether evipan or pentothal given during induction of anaesthesia would be effective in preventing the subsequent development of anaesthetic convulsions. While not being able to give a definite answer to this question, I would like to draw his attention to some experiments of S. W. Ransome and G. Clark (*Proc. Soc. exp. Biol.*, N.Y., 1938, **39**, 453). These workers were investigating the often fatal hyperthermia which follows operations on the brain in the region of the optic chiasma and infundibulum. They observed that this hyperthermia invariably developed after similar operations in cats and monkeys when ether was used as the anaesthetic, but that nembutal injections were effective in controlling it, the temperature rising again as the effect of the nembutal wore off. They also found that when the operations were performed under nembutal hyperthermia did not develop until after several hours, when the depressing effect of the nembutal had worn off.

Evidently barbiturates exert a depressant action upon the temperature-regulating mechanism, and it may be that this is the explanation of their anticonvulsive action in those cases of anaesthetic convulsions associated with excessive temperatures. It may well be that during the period of this depressant action the barbiturates would exert a prophylactic effect.—I am, etc.,

Goodmayes, Essex. R. BLAIR GOULD.

SIR,—In reply to the question at the end of Dr. Massey Dawkins's letter (February 14, p. 238) may I point out that a case of ether convulsions following induction of anaesthesia by pentothal sodium has been reported by F. K. Boston.[1]

Dr. Dawkins, with wartime brevity, has not given enough facts to rule out excessive[2] or deficient[3 4] CO_2 tension or anoxia[5] as factors in the causation of the convulsions he describes. There is considerable evidence in favour of each of these factors bearing a causal relationship to some cases of ether convulsions.

The actual technique[6] in the administration of the anaesthetic has a distinct bearing on the possibility of an abnormal CO_2 tension developing. Information on the following points would be of interest: the rate of flow of the gases; the presence or absence of an intratracheal tube; if present, whether it was connected to an expiratory valve or whether a face-piece was used; whether CO_2 was used; the type and frequency of the respiratory movements prior to the convulsions; was there a "tracheal tug" or chin reflex present?

With regard to anoxia as a possible factor it would be interesting to know some of the following facts. Was the patient

cyanosed before the anaesthetic started, as is the case sometimes in perforated gastric ulcer cases? Was there any cyanosis during anaesthesia before the convulsions began? What proportion of O_2 was being administered? Was the airway good? What was the depth of anaesthesia? Finally, did the convulsions have any relation to the respiratory movements?

I have seen ether convulsions which bore no relation to the respiratory rhythm, but Wells[7] and others have reported cases in which the convulsion took place during expiration and was followed by an inspiratory gasp, during which the convulsions momentarily ceased. Wells associated this type of convulsions with a hot, steamy theatre. If ether convulsions can be divided in this way into two clinical types a step forward may have been taken towards discovering which are the causative factors?—I am, etc.,

Colchester. D. CLENDON.

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Economy of Medical Man-power

SIR,—Major-General R. J. Blackham's rather abusive letter (February 14, p. 241) does not convince me. He assumes, without justification, that I have no experience and that I have not discussed the matter with experienced officers. Far from "rushing into print," my original letter was written after two years of war, at the suggestion of certain medical officers whose up-to-date experience made them anxious on account of the waste of medical men in the Services. Furthermore, I am concerned with the wider problem of man-power, and merely quoted one or two examples; to confine the discussion to one particular appointment seems to side-track the wider issue.

The present military situation appears to call for a good deal of reorganization, in which the medical service must play its part. There is, in my opinion, no ground for complacency.—I am, etc.,

Hove. H. J. MCCURRICH, M.S., F.R.C.S.

SIR,—To meet the present inordinate demand for doctors, why not reduce the period of the curriculum by six months? In my generation our course was completed in four years and ten months, including one year devoted to First M.B. subjects. Were we so very inferior as doctors?

I believe that many students would be found ready for qualification at the earlier date; their academic erudition possibly less sparkling, but their essential knowledge sound enough to justify their acceptance as "safe" potential doctors. Those so accepted could pass to hospital appointments six months earlier and, if thought desirable, could be given the opportunity of an additional resident appointment before being "called" to the Services, thus improving on the present admirable provision in this respect. Some might even be persuaded to spend a period assisting our overworked elder colleagues in general practice, thus gaining for themselves an invaluable experience.

There is a further consideration. Students in these days, particularly in the London area, live in conditions which impose a great strain upon health. To shorten this period of strain is a not unimportant objective.—I am, etc.,

London, W.1. T. TWISTINGTON HIGGINS.

L. B. Strean, G. J. Strean, D. Lapointe, and E. Dechenel (*Canad. med. Ass. J.*, 1941, **45**, 835) report the use of serum globulin from human umbilical cord as a simple and effective means of preventing or modifying measles in children exposed to the disease. The dose was 2.50 c.cm. for modification and 5.10 c.cm. for inhibition if given early in the incubation period. The trial was made on 154 children, 50 receiving globulin solution while 104 served as controls, with the following results. Of the 50 cases, 43 escaped measles altogether, in 5 the attack aborted, and 2 had an ordinary attack; while of the controls 102 developed measles, in 16 of whom the attack was complicated and 2 died. No allergic manifestations occurred in the cases treated with serum.

Obituary

HERBERT LIGHTSTONE, D.S.O., *M.C.*, M.D., C.M.

Director-General of Medical Services, Ministry of Pensions

The death occurred on February 12 of Dr. H. Lightstone, in his 64th year, at Roehampton Hospital. He was born in Canada and received his medical education at McGill University, Montreal.

As a young man he served in the Spanish-American War with the American Red Cross in Cuba, and from 1899 to 1901 he also served with the Canadian Field Artillery in the South African War. After graduating M.D., C.M. at McGill he was medical superintendent of the Women's Hospital, Montreal, and demonstrator of anatomy at Bishop University. He subsequently came to this country, and held the post of registrar of the London Throat Hospital. His service in the last war was conspicuous. He was medical officer, Headquarters, 4th Army, was awarded the D.S.O. and *M.C.*, and mentioned six times in dispatches.

In 1919 he became Headquarters Inspector of the medical staff of the Ministry of Pensions, and was subsequently promoted Director of Medical Services, and in 1933 Deputy Director-General of Medical Services. When the Director-General of Medical Services, the late Sir John Hebb, who died on February 15, was seconded to the Emergency Medical Service in 1938, his place as Director-General of Medical Services at the Ministry of Pensions was taken by Dr. Lightstone.

Dr. R. CUNYNGHAM BROWN, formerly Deputy Director-General of Medical Services at the Ministry of Pensions, writes:

From the end of the world war, 1914-18, to the present one Dr. Lightstone, after an Army career of exceptional distinction, served with the Ministry of Pensions Medical Department practically from its inception until a few days ago. Not long after joining the Ministry in 1919, at the very beginning of a cycle of the Ministry's most strenuous years, he was appointed Headquarters Medical Inspector, a post, especially at that stage of formation of the Medical Division, which called for a rather rare combination of qualities. Loyal, indefatigable, no matter how arduous the journey or the job, imperturbable but inspiring others, Dr. Lightstone more than fulfilled the requirements of his post. His subsequent advancement to Director-General could only seem natural and to be expected of a man of his measure, by those who knew him even in those early days.

He was a man of wide horizons: a spacious mind with many and diverse interests—art, music, and sport—but essentially he was a man of action. Careful to arrive at the truth, when that was attained his words were brief, uncompromising, and to the point, and his actions swift and strong. But also he had in large measure that "understanding of the heart" for which Solomon prayed, and doubtless received, "to discern judgment." And so a very brave soldier, a strong and faithful civil servant, and a great friend has gone from us, and surely, as he passed, "all the trumpets sounded on the other side."

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

W. J. O'Connor, M.D.Adelaide, of Downing College, has been appointed University Demonstrator in Pharmacology from January 1 to September 30, 1942.

It is proposed that the next Final M.B. Examination shall begin on Monday, June 15, a day earlier than is prescribed by Ordinance. The number of candidates is expected to be abnormally high, and it may not be possible to conduct the examination in the normal manner.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England, held on February 12, with Sir Alfred Webb-Johnson, President, in the chair, Mr. E. K. Martin, Prof. A. W. Sheen, Mr. W. H. Bowen, Mr. John Morley, and Mr. P. J. Moir

were re-elected members of the Court of Examiners for the year beginning March 12, 1942.

A letter of greetings was received from the Brazilian College of Surgeons.

Prof. Harry Platt (Manchester) was appointed Robert Jones Lecturer for 1942.

Surgeon Rear-Admiral C. P. G. Wakeley was appointed representative of the College on the General Medical Council, and Sir Robert Kelly was reappointed representative of the College on the Court of the University of Liverpool.

Diplomas

Diplomas of Fellowship were granted to John Rashleigh Belcher (Longfield, Kent) and to Arthur Frederick Rushforth (Orpington).

Diplomas of Membership and Diplomas in Public Health and in Medical Radiology were granted to the candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London published in the *Journal* of February 7 (p. 204). Diplomas of Membership were also granted to R. M. Archer, R. D. Brawn, and P. R. C. Evans.

The Services

MENTION IN DISPATCHES

Temporary Surgeon Lieut. Jocelyn Graham Reynolds, R.N.V.R., has been mentioned in dispatches for resource and devotion to duty.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Surgeon Lieut. ROBERT TROUP, R.N.V.R., who is reported "Missing, Presumed Killed," was the only son of Mr. and Mrs. Alexander Troup of Bo'ness, West Lothian. He was 27 years of age, and graduated M.B., Ch.B. of the University of Edinburgh in 1937, and had held the posts of resident medical officer at the North Devon Infirmary, Barnstaple, and house-physician at Bradford Royal Infirmary. Before entering the R.N.V.R. as temporary surgeon lieutenant in May, 1941, he was house-surgeon at the Perth County and City Royal Infirmary.

AUSTRALIAN ARMY MEDICAL CORPS

Believed Prisoner of War

Captain Lionel Pelham Sapsford.

Medical Notes in Parliament

Health of an Army at War

The Army Estimates for 1942 were introduced on February 19 by Captain MARGESSON. He disclosed that of every 100 men from the British Commonwealth who had been killed or wounded in land fighting between the beginning of the war and January, 1942, about 70 came from the United Kingdom. He explained the "selection testing" of the Army, undertaken since the middle of 1941 to prevent waste of man-power. A simple intelligence test was applied even before men and women were medically examined. At the training unit stage men and women were given tests, some mechanical—and these were devised by scientists—and some with pen and paper. As a result of these tests, coupled with an individual interview, a man was chosen for the duties for which he seemed most fitted.

THE TROOPS ABROAD

Sir FRANCIS FREMANTLE said he had heard the debates on the Army Estimates for 21 years and had found the War Office still looked on the Medical Service as only required to treat wounds in the field. Nevertheless there had been a recognition that when a man arrived in the Army he had to be made healthy and kept healthy in the field. Among the troops fighting on eight fronts there had been remarkably little sickness. A great deal of that improvement was due to the antitoxin which was prepared by the Army Medical Service. There was a great difference between that result and those of the Italians and Greeks with whom they had been able to exchange experience. As regards enteric, there had been few cases among the inoculated British; there were far more among the Italians in Libya. As a result of the tetanus inoculation there had been only two mild cases among the inoculated in all Services. In the Greek hospitals there was a large amount among the Italian and Greek wounded. The Army had opened its eyes to the effects of the deficiency diseases. A series of nutritional scales had to be worked out. A hundred specialized rations had to be prepared for the different races among our troops.

Of cases invalided out of the Army at home 15% were due to psychoneuroses. People of less stable mentality who had been whipped up into the Army were a constant nuisance to themselves and to the Army. The Germans paid more attention to this subject. The British difficulty was that there were not enough people who had gone through the schools in this specialty. The Army had taken on the best of them, and they were helpful, but more required to be done. Higher appointments in the German Army, not only in the Medical Service but in the rest of the Army, were made on the findings of advisers in psychoneuroses.

MEDICAL MAN-POWER

The Services had been asked to modify their demands for more men and had done a good deal in response. More might be done, especially in regard to Service hospitals. Were the men being properly used who were taken from private practice? The demands of the fighting Services were denuding the civil medical service to an alarming extent. So far the country had not suffered seriously from epidemic disease, but there might come a great demand for civilian doctors. The British Medical Association had offered the services of the profession in a general way to the Home Guard, but they wanted organization. There was a skeleton organization in one or two areas. The appointment of medical men to be trained in the Home Guard was not wanted, but doctors desired to know what demands were likely to be made and on what occasions. They wanted a large number of first-aid posts and rest houses to be marked off.

Dr. HADEN GUEST, referring to the Shakespeare Committee on medical man-power, which had reported, said there was in fact no shortage of medical personnel in the country. It was only a question of allocation. The Army had enough people at present, although constantly requiring more, and so had the other Services. The Ministry of Health had, at the instance of this Committee, sent a circular to the Emergency Hospitals asking them to reduce their staffs. That, he thought, would have to be done. He asked why the Shakespeare Committee should be maintained as an executive authority to decide upon the allocation of medical man-power when the Services already had all the executive authority which was required. An increased efficiency in organization of the medical services of the country and the allocation in future along the lines suggested by the Shakespeare Committee should be the business of the heads of the various Services. It should be the business of the head of the Emergency Medical Service, the Chief Medical Officer of the Ministry of Health, the Secretary of the Central Medical War Committee, and representatives of the medical practitioners in the country, under the chairmanship of an independent non-medical person. There would be in that committee knowledge of the needs of the Services and executive authority to allocate the men and women concerned.

GOVERNMENT REPLY

Sir EDWARD GRIGG said much was owed to the R.A.M.C. in the present war. The health of the Army was excellent, and he agreed with Sir Francis that the greatest value of the R.A.M.C. was in keeping it so. The medical service for the Home Guard was complicated and affected the Civil Defence Services as well. The organization was reaching a high degree of efficiency. Dr. Haden Guest's remarks on the Shakespeare Committee would be borne in mind. The Army now had sufficient doctors and realized the importance of not starving the civil population of medical men. There was only one feature in which the health of the troops was not good—80% of the recruits required dental treatment. The good health of the Army extended to troops over-seas.

Notes in Brief

Answering questions on February 12 about the medical examination of recruits, Mr. BEVIN said this examination at present revealed much illness which might be prevented by slight changes in the designing of industrial machinery and the form of occupation.

Mr. Herbert Morrison announces that double summer-time will last this year from April 4 to August 8.

No. 5

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 7.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1942					1941 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	181	11	31	3	6	345	32	88	3	11
Deaths		1	6				6	8		
Diphtheria	920	43	197	62	32	1,103	60	385	25	25
Deaths	29	2	6	—	1	35	2	4	—	—
Dysentery	115	32	46	3	—	168	3	31	—	—
Deaths		—	—	—			—	—	—	
Encephalitis lethargica, acute	6	—	—		—	7	1	1		—
Deaths		—					—			
Enteric (typhoid and paratyphoid) fever						7	—	4	2	1
Deaths						1	—	—	—	—
Erysipelas			46	11	2			53	12	5
Deaths			—					—		
Infective enteritis or diarrhoea under 2 years										
Deaths	42	6	6	6	3	39	4	11	7	1
Measles	1,611	147	140	97	26	15,486	408	171	—	16
Deaths	—	—	—	—	1	32	2	1	2	—
Ophthalmia neonatorum	83	2	17		—	82	6	20		1
Deaths										
Paratyphoid fever	9	—	—	—						
Deaths	—	—	—	—						
Pneumonia, influenzal*	1,366	88	23	8	9	1,741	171	66	13	8
Deaths (from influenza)	84	15	5	1	1	261	56	30	8	4
Pneumonia, primary			361	26				430	14	
Deaths		—		14	11		56		22	23
Polio-encephalitis, acute	1	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	7	—	—	—	—	10	—	3	1	—
Deaths		—	—		—		—	—		—
Puerperal fever	2	2	14	1	—	9	9	13	1	1
Deaths		—					—			
Puerperal pyrexia	176	15	15		2	129	9	24		2
Deaths		—					1			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,113	39	208	33	31	1,217	65	188	37	38
Deaths	—	—	1	1	—	3	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—			—	—	—		
Typhoid fever	11	2	8	6	2					
Deaths	—	—	—	—	—					
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,251	159	31	41	34	3,023	53	458	—	25
Deaths	7	2	2	—	1	38	—	19	1	—
Deaths (0–1 year)	374	49	103	24	23	513	35	98	42	17
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,730	905	852	231	143	7,420	1,327	996	284	184
Annual death rate (per 1,000 persons living)			19·2	15·4	†			21·7	0·7	16·1
Live births	5,324	478	802	311	199	5,428	402	892	340	225
Annual rate per 1,000 persons living			16·6	20·8	†			18·0	22·6	19·7
Stillbirths	212	21	37			198	5	51		
Rate per 1,000 total births (including stillborn)			44					54		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* a rise in notifications was returned for most infectious diseases; the only diseases with a decreased incidence were whooping-cough, dysentery, and paratyphoid.

The notifications of scarlet fever exceeded those of the preceding week by 37. During the past month there has been a tendency towards a slightly higher incidence in the whole country, but no corresponding trend can be observed in the individual counties with the exception of Surrey, Kent, and Lancashire, where an increase has occurred. The number of cases of scarlet fever in the first two counties was small, 36 and 41 during the week reviewed, but Lancashire, with one-fifth of the total cases registered in the country, has shown a steady rise in the number of notifications during the past month: the figures in this county for the last four weeks were 166, 177, 182, and 228.

The continuous but small decline in the notification of diphtheria observed during the past month was broken by a small rise, 28 cases, during the week reviewed.

The notifications of whooping-cough were 188 fewer than in the preceding week. This is the fourth consecutive week that a decrease has been recorded, and the total number of cases for the whole country has declined by 25% since the week ending January 10. There has been a notable geographical difference in the trend of the incidence. Broadly, the decline has been confined to the counties in the southern section of the country, while the notifications of whooping-cough in the counties in the northern section have been fluctuating round a constant level.

A large increase, 376 cases, was recorded in the incidence of measles during the week. This rise was confined to the counties where measles was prevalent. The biggest of the increases recorded were those of London 40, Surrey 74, Hampshire 39, Warwickshire 20, Cheshire 32, and Lancashire 46. The notifications of measles were not distributed uniformly throughout the country, and three-quarters of the total cases were recorded in nine counties.

There was a relatively big increase, 25 cases, in the notifications of cerebrospinal fever. The cases were widely distributed, and only five English counties failed to return a case. The largest county totals were Lancashire 27, Yorkshire West Riding 17, Kent 11, Glamorganshire 10. Multiple cases from the same administrative areas were not common. The areas with more than 2 cases were Liverpool C.B. 8, Sheffield C.B. 6, Birmingham C.B. 4, Manchester C.B. 3, Leicester C.B. 3, Kingston-upon-Hull C.B. 3, Leeds C.B. 3.

In *Scotland* the chief feature of the returns was the large increase in the incidence of measles—140 cases compared with 77 in the preceding week. Edinburgh, with 115 cases, was the main centre of infection.

In *Eire* an outbreak of measles in the district of North Dublin (44 cases) was responsible for the increased incidence of this disease. The relatively large increase in the notifications of diphtheria, from 31 to 62 cases, was widely distributed throughout the country.

In *Northern Ireland* the higher figure for measles was due to the experience of Portrush Urban District, where 21 cases of the total of 26 were recorded.

Returns for the Week Ending February 14

The notifications of infectious diseases during the week included scarlet fever 1,168, whooping-cough 1,203, diphtheria 944, measles 1,793, pneumonia 1,034, cerebrospinal fever 165, dysentery 144, paratyphoid 3, typhoid 10. In the large towns 75 deaths were attributed to influenza.

W. A. Hall (*New Orleans med. surg. J.*, 1941, **94**, 283) records his observations on twenty cases of typhoid fever treated by sulphaguanidine and as many controls. He found that the drug did not decrease the duration or the degree of morbidity, produced no marked fall in temperature or symptomatic improvement, and caused no change in positive stool cultures; nor did it reduce the incidence of complications.

Medical News

Acting on the advice of the Therapeutic Requirements Committee the Minister of Health has decided to include in the drug tariff a new specification for boric acid lint which will be published in the forthcoming supplement to the *British Pharmaceutical Codex*. This lint will contain 5% of boric acid only, and because of its light weight it will be supplied by area instead of by weight. The new nominal sizes will approximate in area to the same nominal weights of the present boric lint, and chemists will be instructed to supply the corresponding size against any prescriptions accidentally ordering by weight. The new boric acid lint will be official on and after April 1 next. As manufacture of the present boric lint containing 40% of acid is being discontinued forthwith, stocks of this lint will soon be exhausted.

On and after March 1 next toxic anaemia will be notifiable under Section 66 of the Factories Act, 1937, in the same way as are certain forms of poisoning (arsenical, lead, mercurial), anthrax, toxic jaundice, etc. The term "toxic anaemia" will apply to any form of dyshaemopoietic anaemia in a person working in contact with *x* rays, radio-active substances, and any chemical compound capable of causing anaemia. Information about such chemical substances is at present incomplete, but T.N.T. is known to cause a progressive anaemia with or without toxic jaundice. The notification should be made by the attending practitioner to the Chief Inspector of Factories, Ministry of Labour and National Service, 28, Broadway, S.W.1.

Dr. C. E. Newman will deliver a lecture on "Dyspepsia in the Army" at the Weston Hotel, Bath, on Thursday, March 5, at 5.30 p.m. All Service medical officers and civilian practitioners will be welcome.

At the meeting of the Medical Society for the Study of Venereal Diseases to be held to-day (Saturday, February 28) at 2 p.m. at 11, Chandos Street, Cavendish Square, W., Captain C. S. Nicol, R.A.M.C., will read a paper on pyretotherapy by intravenous T.A.B. vaccine in the treatment of sulphonamide-resistant gonorrhoea and non-gonococcal urethritis. At the meeting on March 28 the president, Colonel L. W. Harrison, will open a general discussion on methods of enlightenment of the general public on venereal diseases.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Lotion for Pityriasis

DR. A. R. KENNEDY writes: Can any reader advise me of a lotion for use in oily pityriasis of the scalp—one which will not darken the hair in its action?

Treatment of Threadworms

SIR WILLIAM MACARTHUR writes: In reply to Dr. G. H. H. Booth (February 21, p. 280), medicinal gentian violet should be administered in enteric-coated capsules or tablets. (Should there be difficulty in obtaining these I will let Dr. Booth have the name of a manufacturer if he writes to me direct at 48, Priory Road, Bedford Park, W.4.) An adult may be given 1 grain t.i.d. before meals, and this dosage continued for 8 to 10 days. Occasionally some nausea may be caused; this disappears if the treatment is stopped for a day or two, after which interval it may be resumed. For children the recommended dosage is a daily total of 0.15 grain for each year of apparent age (so that an undersized child receives less than a normal child of the same age), this daily total being divided into three doses, given as for adults. Serious organic disease of the kidneys or liver is a contraindication. This note should be read in conjunction with my reply in the *Journal* of January 31, page 171.

"INQUIRER" desires to thank most gratefully the various correspondents who replied to his query regarding the treatment of an obstinate case of threadworms. Most of the suggestions, both as regards reinfestation and drug treatment, had been tried already without avail, and any others have been put to the immediate test since, with, unfortunately, no improvement so far. Further hints would be welcomed.

LETTERS, NOTES, ETC.

"Perfect Sight without Glasses"

SIR JAMES BARRETT, F.R.C.S., writes from Melbourne: The review of the essay by W. H. Bates (September 13, 1941, p. 383) is interesting because, although the main thesis does not accord with the known facts, there are some subsidiary items which are not often recognized. Dr. Jackson of Denver, U.S.A., long ago drew attention to the slight variations of vision which occur in many people. They are sometimes caused by slight conjunctivitis, and are also at times not due to any obvious cause. His long list of observations I have since verified in a number of cases. It is unfortunate for Mr. Bates's thesis that he relies on evidence in fish, which, as you point out, accommodate in a manner entirely different from mammals or birds, and that he quotes dogs and cats, which possess practically no accommodation. The sight of dogs is notoriously imperfect, and far inferior to that of the horse for practical purposes. Perhaps the vogue of this proposal has been assisted by the overuse of glasses and the developments of aniseikonia, etc., which are, I think, largely psychological. I had as a patient an eminent man who was wearing plane glasses and was sure he could see better with them than without. When I showed him what he was wearing his attitude was one of incredulity and amazement that he could have reached such a conclusion. The human brain is an astonishing organ.

Diagnosis of Scabies

DR. E. B. HAZLETON (Torquay) writes: Before the last war (1914-18) scabies was seldom met with in general practice. In some instances not a single case had been seen for fifteen years. About 1917, however, the complaint became prevalent, and many practitioners found it difficult to make a correct diagnosis. The following case illustrates this. A. B. applied for active service. On examination the arms, from the wrists to several inches above the elbows, were found to be covered with large pustules. This condition had lasted for a period of twelve years, during which time a correct diagnosis had not been made. The patient had been treated by autogenous vaccines, also ultra-violet light and infra-red rays and various other applications, without relief. In addition to the usual treatment (ung. sulph. locally) I prescribed tablets to be taken orally containing calcium sulphide 1/4 grain and sulphur 2 grains t.d.s. The skin of the arms is now normal.

Epanutin for Epilepsy

DR. T. D. CULBERT (Nelson, Lancs) writes: The following is the history of a patient of mine with epilepsy over the past five years. He has kept a record of all his fits in that time, but has never been seen by me in one. All the fits were "grand mal," those described as "minor" being lesser in intensity and duration. During the period reviewed he was treated by bromides, luminal, quackery, and epanutin; the sequence is significant. In 1937 he had 19 attacks. In 1938 he had 18 attacks till October 31, when he switched from bromides to luminal; he had one minor attack in November and one in December. In 1939 up to March 18 he had 8 major and 3 minor attacks; he then went on epanutin capsules (grains 1½) one t.d.s., and up to the end of 1939 had 26 major and 2 minor attacks. In 1940, up to August 26, he had 26 major attacks. He then ceased the epanutin and tried a patent remedy. From September, 1940, to December, 1940, he had 13 major and 13 minor attacks, and came in to see me in desperation, threatening suicide. He was put on epanutin capsules (grains 1½), 4 daily, on December 4. In 1941 he had 5 attacks in January. Since then (one year ago) he has had only one attack, and that was his own fault, as it was a result of allowing himself to run out of capsules. His gratitude is boundless. While little weight can be placed on one clinical case record, this is the history of a man for whom the treatment of his epilepsy by means of sodium diphenyl hydantoinate has made life worth living. He has frequently stated to me that it has none of the depressant effects of bromide and luminal. An interesting point to note is the necessity for adequate dosage, for unless this is given the drug will not exert its effect.